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JOURNAL
OF THE
ASIATIC SOCIETY OF BENGAL,

EDITED BY
THE SECRETARIES.

VOL. XXVI.

Nos. I. to VI.—1857.

“It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted; and it will die away, if they shall entirely cease.”
—SIR WM. JONES.

CALCUTTA :

PRINTED BY C. B. LEWIS, BAPTIST MISSION PRESS.

1858.

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JOURNAL

OF THE

ASIATIC SOCIETY.

No. I. 1857.

An Account of the Ancient Buddhist Remains at Pagán on the Iráwádi.—By Captain HENRY YULE, Bengal Engineers.

The Burmese monarchs derive their stem from the S'ákya kings of Kapilavastu, the sacred race from which Gautama sprang. One of them, Abhi-Rája by name, is said to have migrated with his troops and followers into the valley of the Iráwádi, and there to have established his sovereignty at the city of Tagoung: a legend manifestly of equal value and like invention to that which deduced the Romans from the migration of the pious Æneas, the ancient Britons from Brut the Trojan, and the Gael from Scota daughter of Pharaoh.*

But that Tagoung was the early capital of the Burmans, appears to be admitted, and is probable, supposing the valley of the Iráwádi to have been settled from the north. There, they relate, (as is told also of Annrádhápura in Ceylon), a city or a succession of cities had existed even during the times of each of the three Buddhas who preceded Gautama. The last foundation of Tagoung took place, according to story, in the days of Gautama himself, and this city was the seat of seventeen successive kings.†

From Tagoung a wild legend carries the dynasty to Prome, where an empire under the Pali name of Sare Khettara (*Sri Kshetra*) was

* I see, however, since the text was written, that Lassen accepts the traditions of the Indian origin of the Burmese Kings as genuine. (*Indische Alterthumskunde*, II. 1034.)

† Col. Burney in *J. A. S. B.* vol. V. p. 157.

established about 484 B. C. It does not appear from the authorities whether the kingdom of Tagoung is believed to have continued contemporaneously with that of Prome.

There is no doubt that the frequent shiftings of their capitals is characteristic of the Indo-Chinese nations, and is connected with the facilities for migration presented by their great navigable rivers, and by the unsubstantial nature of their dwellings. Still, one cannot but have some suspicion that the desire to carry back to a remoter epoch the existence of the empire as a great monarchy, has led to the representation of what was really the history of various petty principalities, attaining probably an alternate preponderance of dominion, as the history of one dynasty of monarchs in various successive seats.

Pegu, it need not be said, was an independent kingdom, though several times subjected for a longer or shorter period by the Burmans previous to the last conquest by Alompra, and twice at least in its turn subjecting Ava.* Toungú also appears undoubtedly to have been a separate kingdom for a considerable period, two of its kings or princes in succession having conquered Pegu during the sixteenth century; and Martaban was the seat of an independent prince for at least 140 years. Tavoy was occasionally independent, though at other times alternately subject to Pegu or Siam. Aracan, bearing much the same relation to Burma that Norway did to Sweden, preserved its independence till the end of the last century. But besides these, there are perhaps indications of other principalities within the boundaries of Burma proper. Kings of Prome are mentioned in the histories of the Portuguese adventurers. Ferdi-

* In the thirteenth century three generations of Burman kings reigned over Pegu. In 1554 or thereabouts, the king of Pegu, who was a Burmese prince of Toungú, conquered Ava and its empire as far as Mogoung and the Shan state of Thein-ní. This was the acme of Peguan prosperity, but even that was under a Burmese sovereign. About 1613 the king of Ava became master of Pegu and all the lower provinces. So matters continued till the Peguan revolt of 1740 and the following years, which not only succeeded in the expulsion of the Burmans, but in 1752 in the conquest of Ava. This brief ascendancy was upset in the same year by the Hunter-Captain Alompra, whose dynasty still sits on the throne of Ava, though Pegu has passed into the hands of the *Kalás*.

nand Mendez Pinto speaks of several other kingdoms on the Iráwadí; but he is to be sure a very bad authority. Father Sangermano also, in his abstract of the Burmese chronicles, appears to speak of contemporary kings of Myen-zain or Panya, Ta-goung and Tsa-gaing.*

These instances may, however, originate only in the ambiguity of the Burmese title MEN, which is applied equally to the King of England and to the Governor General of India, to the king of Burma and to all the high dignitaries and princes of his provinces.

The Empire of Prome came to an end, it is said, through civil strife,† and one of the princes, in A. D. 107, flying to the north, established himself at Pagán. According to the view taken by Crawford and Burney, as well as Sangermano, the Burmese monarchy continued under a succession of fifty-two or fifty-five princes, to the end of the thirteenth century.

But the authority quoted by Mr. Mason‡ (apparently an edition of the royal chronicle) implies that the city founded, or re-founded, in 107 was that of *Upper* Pagán on the Upper Iráwadí closely adjoining Tagoung, and that the Pagán of which we now speak was not founded till 847 or 849.

The site of upper Pagán has been visited by Captain Hannay in 1835, and by the Rev. Mr. Kincaird in 1837.

Capt. Hannay says,§ “About a mile to the south of this (Tagoung) is a place called Pagam-myo, which is now a complete

* Description of the Burmese Empire, pp. 42, 43.

† The following quaint legend is related by Sangermano. On the day of the last king's death it happened that a countryman's cornsieve, or winnowing fan, was carried away by an impetuous wind. The countryman gave chase, crying out: “Oh my cornsieve! oh my cornsieve!” The citizens, disturbed by the clamour, and not knowing what had happened, began likewise to cry, “Army of the Cornsieve! Soldiers of the Cornsieve!” A great confusion consequently arose and the citizens divided themselves into three factions, who took up arms against one another, and were afterwards formed into three nations, the Pyu, the Karan, and the Burmese. (The *Pyu* were probably the people in the neighbourhood of Prome; Karan or Kanran the Aracanese. See PHAYRE in J. A. S. B. XIII. 29.)

‡ *Natural Productions of Burma*, II. 450.

§ M. S. Narrative of a journey from Ava to the Amber-mines near the Assam frontier. (*In Foreign Office, Calcutta.*)

jungle, but covered with the remains of brick buildings as far as the eye can reach. There are also the ruins of several large temples which have now more the appearance of earthen mounds than the remains of the brick buildings, and they are covered with jungle to the top." The people on the spot told Capt. Hannay that the city was much more ancient than the other Pagáu. And indeed we heard this upper city spoken of as "old Pagán," when we were at the capital.

Some interesting discoveries in Burmese history and antiquities may yet be made among the ruins of which Capt. Hannay speaks.

Nine of the oldest temples at Pagáu are ascribed, according to Crawford, to king Pyán-bya, circa 850. This coincides with the reign and date to which Mr. Mason's account assigns the foundation of the city.

Here then twenty-one kings reigned in regular succession from the middle of the 9th to the end of the 13th century, and here in the year 997, under the apostleship of A-ráhan and the reign of Anan-ra-men-zan, Buddhism was established in its present shape as the religion of the country.*

The history of the destruction of Pagáu has been related by Col. Burney from the Burmese chronicles.† Indignant at the murder of an ambassador by the Burmese king, the Emperor of China sent a vast army to invade Burma. The king, Narathee-ha-padé, in his anxiety to strengthen the defences of his capital, pulled down, for the sake of the materials, (so the chronicle relates), one thousand large arched temples, one thousand smaller ones, and four thousand square temples. But under one of these temples a prophetic inscription of ominous import was found: the king lost heart, left his new walls defenceless and fled to Bassein. The Chinese advanced, occupied the city, and continued to pursue the Burman army as far as Taroup-mau, or Chinese point, a considerable distance below Prome. This was in 1284.

Colonel Burney has indicated that this is the same Chinese invasion which is spoken of by Marco Polo. Turning to that traveller (in Purchas, vol. III. 93,) we find that when the Great

* Judson's Life, I. 199, and Crawford, p. 491.

† J. A. S. B. Vol. IV. p. 402.

Khan minded to subdue the city of Mien, [the Chinese name for Burma] he sent a valiant Captain, and an army chiefly composed of jesters with whom his court was always furnished.

It is curious enough to contrast the contemptuous view of the Burmese enterprise here indicated, with the history of the same event as given by the Burmans in their chronicle. Instead of an army of jesters they represent the emperor to have sent a host of at least six millions of horse, and twenty millions of foot, to attack Pagán, and to have been obliged to reinforce these repeatedly before they could overcome the resolute resistance of the Burmese, who encountered the enemy near the mouth of the Bamó river.

From the mention of this locality it would appear that the Chinese invasion took place by the route still followed by the main body of the Chinese trade with Burma.

Pagán surprised us all. None of the preceding travellers to Ava had prepared us for remains of such importance and interest. I do not find any mention of Pagán and its temples before the middle of the last century, when Capt. George Baker and Lieutenant North were sent on a joint embassy to Alompra from the British settlement at Negrais. Lieut. North died at Pagán, or rather at Nyong-ú, a considerable trading town at the northern extremity of the ruins. On his way down, Capt. Baker seems to have staid a week at "Pagang Youngoe." He mentions the great number of pagodas in the neighbourhood, and one in particular, "the biggest of any between Dagon (Rangoon) and Momchabue (Moutshobo the residence of Alompra,) kept in good repair, and celebrated by the people for having one of their god's teeth and a collar bone buried under it."*

Colonel Symes visited some of the temples on his way both up and down the river, and gives a somewhat vague account of the Ananda, which was then undergoing repair at the expense of the Prince Royal. He was told that the prince had collected gold for the purpose of gilding it, an intention which the size of the building renders improbable, and which certainly was not fulfilled.

Cox also describes the Ananda, and took some measurements with the intention of making a plan of the building.

* Dalrymple's Oriental Repertory, I. 171.

Among the ruins of the ancient city on the 8th February, 1826, the Burmese under the hapless Naweng-bhuyen, or “King of Sunset,”* made their last stand against Sir Archibald Campbell’s army, which remained encamped there for some days afterwards. Havelock, in his history of the Campaign, notices the numerous monuments, but says; “the sensation of barren wonderment is the only one which Pagálm excites. There is little to admire, nothing to venerate, nothing to exalt the notion of the taste and invention of the people which the traveller might already have formed in Rangoon or Prome.” It will be seen presently that we differ widely in opinion from Colonel Havelock.

The account that conveys the most truthful impression of Pagán is probably that contained in the travels of Mr. Howard Malcom, an American missionary traveller.

Mr. Crawford indeed devotes several pages of his admirable book to the detailed description of some of these buildings, and gives an engraving of that which he considered the finest architectural work among them. From his selection in this instance I utterly dissent. The temple which he has engraved is, as compared with the greater works at Pagán, paltry and debased. It is altogether uncharacteristic of the peculiar Pagán architecture; nor is it indeed well or accurately represented in the print. Mr. Crawford’s descriptions too, an accurate observer as he is, fail somehow to leave with his readers any just impression of these great and singular relics. From that preference of his which has been referred to, it strikes me that he did not himself do justice to the grandeur or interest of these buildings, and therefore could not enable his readers to do so. With the assistance in illustration that we enjoy, we ought to be able to do better.

In Pegu and lower Burma, the Buddhist pagoda is seldom found in any other form than that of the solid bell-shaped structure, representing (though with a difference) the topes of ancient India and the Chaityas of Tibet, and always supposed to cover a sacred

* Otherwise Laya-thooa. He fled to Ava, and appeared before the king demanding new troops. The king in a rage ordered him to be put to death. The poor fellow was tortured out of life before he reached the place of execution.—Judson’s Life, I. 295.

relic. Images of Gautama are often attached to these, but do not seem to be essential to them. The great Pagodas of Rangoon, Prome, and Pegu are celebrated examples of this kind of edifice.

The type of the principal temples at Pagán is very different, and they suit better our idea of what the word *temple* implies. Remains of this description but on a small scale, first attracted our attention at Tantabeng, a place on the east bank of the Iráwadí some miles above Yenangyoung.*

The buildings at Tantabeng† were numerous, had an air of great antiquity, and were, as far as we examined them, on one general plan. The body of the buildings was cubical in form, inclosing a Gothic-vaulted Chamber. The entrance was by a projecting porch to the east, and this porch had also a subsidiary door on its north and south sides. There were also slightly projecting door-places on the three other sides of the main building, sometimes blank and sometimes real entrances. The plan of the building was cruciform. Several terraces rose successively above the body of the temple, and from the highest terrace rose a spire bearing a strong general resemblance to that of the common temples of Eastern India, being like the latter a tall pyramid with bulging sides. The angles of this spire were marked as quoins, with deep joints, and a little apex at the projecting angle of each, which gave a peculiar serrated appearance to the outline when seen against the sky. These buildings were entirely of brick; the ornamental mouldings still partially remained in plaster. The interior of each temple contained an image of Gautama, or its remains. The walls and vaults were plastered and had been highly decorated with minute fresco painting.

Such is the substantial type of all the most important temples at Pagán, though when the area of the ground-plan expands from 30 or 40 feet square to 200 or 300 feet square, the proportions and details of the parts necessarily vary considerably.

* Mr. Oldham says that he saw a chambered pagoda as low down as Akouktoung (below Prome.) There is a conspicuous one also at Thayet Myo. But they are comparatively rare anywhere below the point named, and never, I think, of the antique type here described.

† These have been photographed by Captain Tripe.

The Pagán ruins extend over a space about eight miles in length along the river, and probably averaging two miles in breadth. The present town of Pagán stands on the river side within the decayed ramparts of the ancient city, near the middle length of this space.

This brick rampart and fragments of an ancient gateway shewing almost obliterated traces of a highly architectural character, are the only remains at Pagán which are not of a religious description. If any tradition lingers round the site of the ancient palaces of the kings, who reigned here for so many centuries, our party missed it.

Of the number of the temples at Pagán, I feel scarcely able to form any estimate, the few days which we spent there having been chiefly devoted to a detailed examination of some of the most important. But of all sizes I should not guess them at less than eight hundred, or perhaps a thousand.

All kinds and forms are to be found among them; the bell-shaped pyramid of dead brick-work in all its varieties; the same, raised over a square or octagonal cell containing an image of the Buddha; the bluff knoblike dome of the Ceylon Dagobas, with the square cap which seems to have characterized the most ancient Buddhist Chaityas as represented in the sculptures at Sanchi, and in the ancient model pagodas in the Asiatic Society's Museum; the fantastic Bo-phya or Pumpkin Pagoda, which seemed rather like a fragment of what we might conceive the architecture of the moon, than anything terrestrial; and many variations on these types. But the predominant and characteristic form is that of the cruciform vaulted temple, which we have described above.

Three at least of the great temples, and a few of the smaller ones of this kind, have been from time to time repaired, and are still more or less frequented by worshippers. But by far the greater number have been abandoned to the owls and bats, and some have been desecrated into cow-houses by the villagers.

In some respects the most remarkable of the great temples, and that which is still the most frequented as a place of worship, is the Ananda.

"This temple is said to have been built in the reign of Kyan-yeet-tha, about the time of the Norman conquest of England. Tradition

has it, that five *Rahandahs*, or Saints of an order second only to a Buddha, arrived at Pagán from the Hema-wúnda or Himálayan region. They stated that they lived in caves on the Nanda-múla hill (probably the Nnndá Deví Peak), and the king requested them to give him a model of their abode, from which he might constrnet a temple. The Rahandahs did as they were requested, and the temple being built was called *Nanda-tsi gun* or "Caves of Nanda." (Pl. I.) The term Ananda, by which the temple is now known, is a corruption, arising from the name of Ananda, the cousin and favourite disciple of Gaudama, being so well known to the people. The representation of a cave is a favourite style of building among the Burmese for depositing images.* This is not wonderful among the votaries of a religion which regards an ascetic life in the wilderness as the highest state for mortals in this world."†

Major Phayre mentioned another probable origin of the name of this temple, viz. from the Palee *Ananta* "the endless;" which seems to be supported by the fact that another great temple close at hand is called *Thapinyu*, "The omniscient."

To reach the Ananda we passed out through the principal eastern gate of the ancient city. The remains of the defences form a distinct mound and ditch, traceable in their entire circuit, and large masses of the brick work still stand at intervals, but I saw none in which any feature of the architecture, or portion of the battlements, was distinguishable. The gate has some remains of architectural design, and ornament of a rich character in plaster, with foliated pilaster capitals and festoons; but these remnants have been disfigured and obscured by the erection of two coarse modern niches with figures of Warders. A few yards beyond the gate are the square sandstone inscribed pillars mentioned by Mr. Crawford. Their appearance is suggestive of great antiquity and interest. But the expectation of the latter would probably be disappointed by an interpretation. The character appeared to be square‡ Bur-

* Several of the temples at Pagán are named in this way; e. g. *Shwé-kú*, "The golden cave;" *Sembyo-kú*, "The white elephant cave," &c.—H. Y.

† Note by Major Phayre.

‡ I do not know whether it has been noticed that the circular form of the ordinary Burmese character, as of the Ooria, the Tamul and several other South

mese of a very neat and uniform type, as indeed most of the Burmese inscriptions are, and very much superior in execution to what *our* lapidary inscriptions were a century ago.

In the precincts of the Ananda we entered a large group of monastic buildings, forming a street of some length. These in beauty of detail and combination, were admirable. The wood carving was rich and effective beyond description; photography only could do it justice.

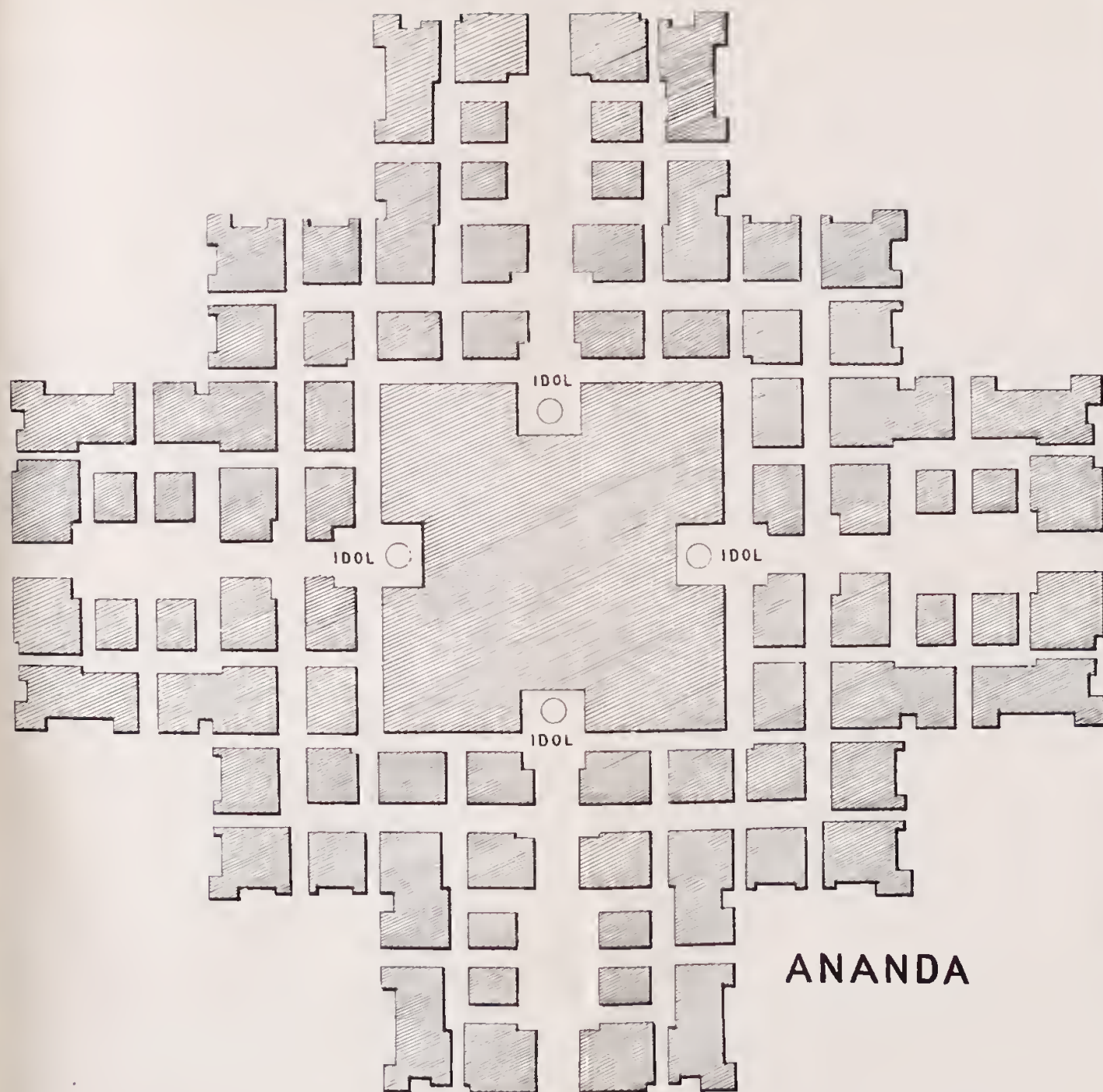
Great fancy was displayed in the fantastic figures of warriors, dancers, *Náts* (spirits) and *Bilús* (ogres,) in high relief, that filled the angles and nuclei of the sculptured surfaces. The fretted pinnacles of the ridge ornaments were topped with birds cut in profile, in every attitude of sleeping, pecking, stalking, or taking wing. With the permission of a venerable and toothless poongyee we looked into a chamber which was a perfect museum of quaint and rich gilt carving, in small shrines, book chests, &c., not unlike the omnium gatherum of a Chinese Joss-house. One chamber contained, among other things, a neat model of a wooden monastery with its appropriate carving.

The most elaborate of these religious buildings is stated to have been built only a few years ago by a man of Ye-nan-gyoung; probably some millionaire of the oil trade.*

In the same monastic street a brick building, in the external form of a Kyoung, contains a corridor entirely covered with rude paintings on the plaster. These are all, Major Phayre informs me, representations of *Jats* or passages in the life of Gautama in various periods of pre-existence. The greater part of the scenes appeared to depict the amusements and employments of ordinary life, such as feasting, hunting, weaving, looking at plays, being *shampooed*, and the like. The persons represented, like the marionnettes in the puppet plays, were all exhibited with pure white complexions. By a curious self-delusion, the Burmans would seem to claim that

Indian alphabets, is a necessary result of the practice of writing on palm leaves with a style. Certain of the sacred books which are written in the *square* character are inscribed with a black gum (the *thit-see*) used as ink.

* Photographed by Capt. Tripe.



0 10 20 30 40 50 60 70 80 90 100 200 Feet

Scale 40 Feet = an Inch.

in theory at least they are white people.* And what is still more curious, the Bengalees appear indirectly to admit the claim; for our servants in speaking of themselves and their countrymen, as distinguished from the Burmans, constantly made use of the term ‘*Kálá admi*’—black man, as the representative of the Burmese *Kálá*, a foreigner.

In one part of the series were some representations of punishment in the Buddhist Hells. Demons were pictured beating out the brains of the unhappy with clubs, or elephants trampling on them, and in one place was a perfect picture of Prometheus; the victim lying on the ground, whilst a monstrous unclean bird pecked at his side.

From this monastic colony a wooden colonnade, covered with the usual carved gables and tapering slender spires, led to the northern doorway of the Ananda.

This remarkable building, with a general resemblance in character to the other great temples, has some marked peculiarities and felicities of its own. They all suggest, but this perhaps above them all suggests, strange memories of the temples of Southern Catholic Europe. The Ananda is in plan a square of nearly 200 feet to the side, and broken on each side by the projection of large gabled vestibules which convert the plan into a perfect Greek cross.† (Plate II.) These vestibules are somewhat lower than the square mass of the building, which elevates itself to a height of 35 feet in two tiers of windows. Above this rise six successively diminishing terraces connected by curved converging roofs, the last terrace just affording breadth for the spire which crowns and completes the edifice. The lower half of this spire is the bulging mitre-like pyramid adapted from the temples of India, such as I have described at Tantabeng: the upper half is the same moulded taper pinnacle that terminates the common bell-shaped pagodas of Pegu. The gilded tree caps the

* But so also thought some of the old travellers. Thus Vincent Leblanc says; “The people (of Pegu) are rather whites than blacks, and well shap’d.” I think I have seen some brahmins fairer than any Burmans. But the average tint in Burma is much lighter than in India. One never, I believe, sees a Burman to whom the word *black* could be applied fairly.

† See also Capt. Tripe’s photograph, No. —.

whole at a height of one hundred and sixty-eight feet above the ground.

The building internally consists of two concentric and lofty corridors, communicating by passages for light opposite the windows, and by larger openings to the four porches. Opposite each of these latter, and receding from the inner corridor towards the centre of the building, is a cell or chamber for an idol. In each this idol is a colossal standing figure upwards of 30 feet in height. They vary slightly in size and gesture; but all are in attitudes of prayer, preaching, or benediction. Each stands, facing the porch and entrance, on a great carved lotus-like pedestal, within rails like the chancel-rails of an English church. There are gates to each of these chambers, noble frames of timber rising to a height of four and twenty feet. The frame bars are nearly a foot in thickness, and richly carved on the surface in undercut foliage; the pannels are of lattice work, each intersection of the lattice marked with a gilt rosette.

The lighting of these image chambers is perhaps the most singular feature of the whole. The lofty vault, nearly 50 feet high, in which stands the idol, canopied by a valance of gilt metal curiously wrought, reaches up into the second terrace of the upper structure, and a window pierced in this sends a light from far above the spectator's head, and from an unseen source, upon the head and shoulders of the great gilded image. This unexpected and partial illumination in the dim recesses of these vaulted corridors, produces a very powerful and strange effect, especially on the north side, where the front light through the great doorway is entirely subdued by the roofs of the covered approach from the monastic establishments.*

These four great statues represent the four Buddhas who have appeared in the present World Period.†

* "A similar artistic introduction of the light is mentioned by Mr. Fergusson as characterising 'the great rock-cut Basilicas of India.'" (*Handbook of Arch.* 1. 313.) May this not have been imitated in the Ananda, and may the fact not be in some degree a confirmation of the legend, that caves were intended to be represented by these vaults?

† "They are said to be composed of different materials as follows:

The temple, like the other great temples here, is surrounded by a square enclosure wall with a gate in each face. "That to the north is the only one in repair. This was no doubt intended as the principal entrance, and has the image of Gautama placed there, but it is difficult to say why the western entrance was not chosen for this distinction,* as it is directly in sight of the Tan-Kyee hill and Pagoda, on the opposite site of the Irawadee, where Gautama himself stood with his favourite disciple, Ananda, and predicted the future building and greatness of the city of Pagán. Perhaps the north was chosen as being the direction in which Gautama walked after the moment of his birth."†

In the centre of the vestibule on the western side stands cut in stone on an elevated and railed platform, a representation of the impression of Gautama's feet. In the galleries or corridors running round the building, disposed in niches along the massive walls, at regular distances apart, are numerous images of Gautama, and sculptured groups of figures illustrating particular events of his life. These have been covered over with a substance resembling *thitsee* (black gum resin) and vermilion.‡

"The image to the east is the Buddha *Kankathan* made of a sweet-scented wood called *Dan-tsa-goo*. To the west is *Ka-thaba*, made of brass. To the north *Gautama*, of Fir; to the south *Ganno-goon* of Jasmine-wood. Whatever the original material of these images may have been, it appears now that the outer coating of each is of plaster richly gilt over."—Major Phayre.

* Compare Cunningham's *Topes of Bhilsa*, p. 191. It there appears that at No. 1 Tope at Sanchi, within the enclosure and immediately facing each entrance, there is a large figure, once under a canopy. That to the east Major Cunningham considers to be "KRAKUCHANDA, first mortal Buddha; that to the south KANAKA; to the west KASYAPA; and to the north SAKYA SINHA" (Gautama). Hence it would appear that the figures in the Ananda were not placed arbitrarily, but according to orthodox Buddhistic tradition.—H. Y.

† Major Phayre.

‡ I extract the following detailed account of some of these curious groups from Major Phayre's notes. Lt. Heathcote, I. N. informs me that the number of these sculptures is upwards of fifteen hundred.

"Several, indeed, most, of the images of Gautama in this temple have a different physiognomy to those made by Burmese artists, and the Woondouk who accompanied me, asked if I did not notice a strong resemblance in the features to those Buddhist images in the compound of the Asiatic Society at Calcutta, which have

The outer corridor is roofed with a continuous flying buttress, or half pointed arch, abutting on the massive outer walls. The inner corridor and cells are pointed vaults.

been brought from central India. There is undoubtedly a great similarity, so that it is impossible not to conclude that these have been carved by Indian artists. The following are the principal figures and groups illustrating events of Gautama's life. A recumbent female figure richly clad with large earrings, and pendent ears, decked with numerous armlets from the wrist to the elbow; the figure and dress are entirely in the Indian fashion. The hair of all the female figures in these groups is bound up sideways in the form of a cornucopia, and in a fashion, certainly not Burmese. This is said to be the Princess Ya-thau-da-yá,* the wife of Prince Theiddat,† i. e. Gautama, before he left his father's kingdom and became a hermit. The four predictive signs displayed to the Prince, and which, convincing him of the vanity of all earthly things, determined him to leave his father's palace and go forth to the wilderness, are here displayed in separate groups. The Prince, from his chariot, sees the decrepid man, the diseased, the dead and decayed, and finally the Priest ordained. He chooses the latter state as the only refuge from the ills of mortality. In another sculpture is represented a stately female with her left arm round the neck of another, and both standing beneath a tree. This is the figure of Gautama's mother called Amay-dau-ma-ya,‡ beneath the Engyeen tree (*Shorea robusta*), when giving birth to her son while on a journey. She leans on the neck of her younger sister Gau-da-mee. A female attendant is near at hand. On the right of the mother is seen the infant, as if just born, but displaying his inherent glory, while three other minute figures of him denote his being received by the three higher orders of beings, Byahmas, Náts and men, the latter being lowest and receiving him on earth. This scene is repeated four times in the temple with some small variations.

It would be tedious to recount in detail the whole of these interesting sculptures; but I will mention that they include Prince Theiddat† in his palace surrounded by musicians and attendants, but dissatisfied with worldly splendour; then they show him taking a last look at his sleeping wife and child, before going forth to the wilderness; mounting his horse, and leaving, despite of all opposition; stringing a famous bow before the Court of his maternal uncle Thoopa-bhood-da,§ the King of De-wa-da-ha, who then bestowed on him in marriage his daughter Ya-thau-daya.

All these and many others, the subjects of which, I did not recognize, but which evidently relate to events in the life of Gautama, have no doubt been chiseled by Indian artists at an early period.

* Yasodhará.
‡ Mahā Māyā.

† Siddhārtha.
§ Supra-Budha.

One of the peculiar features of the Ananda is the curved slope given to the roofs both of the porches and of the main building, as if preserving the extrados of the arch which lies beneath. In all the other temples the roofs are flat. This, with the massive gables which are thus formed at the ends of the porches, and the great scrolls, if we may call them so, at the wings of these gables, probably go far in producing that association with the churches of southern Europe to which I have alluded.* Still these scrolls are perfectly Burman, and seem identical with the horn-like ornaments which are so characteristic of the Burman timber buildings. Here they are backed (another unique circumstance) by lions rising *gradatim* along each limb of the gable or pediment. The windows also of the main building, standing out from the wall surface with their effective mouldings, pilasters, and canopies, recall the views of some of the great Peninsular monasteries.

But not the exterior only was redolent of kindred suggestions. The impression on us, (I speak of Major Allan, Mr. Oldham, and myself,) as we again and again paced the dim and lofty corridors of the Ananda, was that of traversing some sombre and gigantic pile appropriated to the cabals and tortures of the Inquisition. No architecture could better suit such uses. And in the evening, as I sat in the western vestibule sketching the colossal idol before me, the chaunted prayers of the worshippers before the northern cell boomed along the aisles in strange resemblance to the chaunt of the priests in a Roman Catholic cathedral.

Of the details of architecture I shall speak below, but before proceeding to describe any of the other temples, it may be well to notice the material of which they are built. This, I believe to

I should have mentioned that on the outside of the building, and about three feet above the ground, glazed tiles are set closely all round it, having rude figures of monsters on them, some riding camels and other animals unknown in Burmah. These have Pali inscriptions on them, intimating that the figures represent the soldiers of the evil spirit, who sought to alarm Gautama from his resolution of becoming an ascetic and attaining Buddhahood.

* Compare the elevation of the entrance to one of the vestibules of the Ananda with that very common façade of Italian churches. The analogy in the composition is, I think, very striking. The R. C. Church at Agra has a façade of this type.

be in every case the same, viz. what we call in India *kucha pukka* work, that is to say, brick cemented with mud only. Mr. Crawford supposed the temples to be of brick and lime mortar. But I satisfied myself that this is not the case, and that the penetration of the plaster, which had been applied to the walls and corridors, into some of the joints had misled him.* We are not indeed accustomed in India to conceive of *kucha pukka* edifices two hundred feet in height. Of these it is to be said that they are so massive as to be practically almost solid; so that the vaults and corridors rather resemble excavations in the mass than structural interiors. It is also to be said, however, that they are built with a care and elaboration which I never saw bestowed on a *kucha pukka* structure in India, and which the Burmans of the present day seem remotely incapable of in brickwork of any kind. On the outside at least, in the better buildings, every brick has been cut and rubbed to fit with such nicety that it is difficult, and sometimes not possible, to insert the blade of a knife between the joints. The arches and semi-arches are carefully formed of bricks moulded in the radiating form of voussoirs. The peculiarity of these arches is that in general the bricks are laid edge to edge in the curve of the arch, instead of being laid parallel with its axis as among other nations. The exterior archfaces of the smaller doors and windows are, however, laid in the European way, with the bricks cheek to cheek.

The bricks are usually about 14 inches by 7, (I here speak from memory,) and well moulded, but they are not very well burnt.

Such being the substance of the structure, all the ornamental finish is consequently executed in the plaster, which, even without view to ornament, would have been essential to the preservation of the buildings.

Where the plaster has been kept in repair, the buildings remain apparently perfect. Where the original plaster has decayed, and has not been renewed, the temples are in ruins. But it is in the latter only that we can learn to do justice to the spirit of art that

* Mr. Oldham notes his impression that the Bauddhi temple is built with lime mortar.

adorned these monuments. The renewals and repairs have been executed by barbarous and tasteless hands. Of this I shall speak more fully by and bye.

The second great temple of Pagán is the *Thapinyu*—"the Omniscient."

It is stated to have been built in the reign of A-loung-tsee-chyoo Men, grandson of the king who erected the Ananda, about the year of our era 1100.*

It stands within the ancient walls, some five hundred yards to the south-west of the Ananda, and its taper spire, rising to a height of two hundred and one feet from the ground, overtops all the other monuments.

Its general plan is not unlike that of the Ananda, but it does not, like the latter, form a symmetrical cross. The eastern porch alone projects considerably from the wall. The body of the building forms a massive square of more than one hundred and eighty feet to the side.

The characteristic of the Thapinyu is the great elevation of the mass before considerable diminution of spread takes place, and the position of the principal shrine high above the ground.

We have first a spacious two-storied basement like that of the Ananda, then two receding terraces. But here the usual gradation is interrupted. The third terrace, instead of rising a few feet only like the others, starts at one leap aloft to a height of some fifty feet in a truly massive and stupendous cubical donjon, crowned again at top by a renewal of the pyramidal gradation of terraces, and by the inevitable culminating spire.

Within this donjon, in a lofty vaulted hall opening by pointed gateways to the east, north and south, and directly under the apex of the spire, sits the great image of the shrine. This is, with one exception, the only instance I have seen in these temples, in which

* The dates given are those traditionally ascribed to the temples, and are the same with those already given by Crawfurd. Major Phayre considers the inscriptions at Pagán, so far as he had time to examine them, to confirm these dates, very remarkable as they are under the circumstances.

the core of the building beneath the central spire had been hollowed into a chamber.

The principal shrine of the temple being thus in the lofty upper tower, the basement contains little of interest in the interior arrangements. There is on the ground level but one corridor, with images in the halls opposite the north, south, and west doorways. The main, or eastern, doorway is faced by a staircase leading to the upper terraces, but first to a curious mezzanine or entresol, forming a double corridor, running round the basement story at the level of the second tier of windows. This also is a peculiarity of the Thapinyu.

The Gauda-palen is the third and last of the greater temples which have been kept in repair. (Pl. III.) It dates from the reign of Na-ra-pa-tí-tsí-thú, about A. D. 1160.

Crawfurd explains the name as signifying, "the throne of Gauda"—a Nát or spirit. Major Phayre, though unable to obtain a satisfactory solution of the name, expresses strong disbelief that a Buddhist temple could be named after a Nát.

Though of great size, and rising to a height of 180 feet, this temple covers a considerably less area than the two already described. It is within the city walls, and stands on lower ground than they do; but being nearer the river it is very conspicuous in approaching Pagán from the southward. Gleaming in its white plaster with numerous pinnacles and tall central spire, we had seen it from far down the Irawadí, rising like a dim vision of Milan cathedral. This enchantment it lost of course on nearer approach, though still strongly suggestive of south-European church architecture, more so perhaps than any other of these buildings except the Ananda. It is cruciform in plan, and stands on a low parapetted terrace irregularly following the outline.

It is more compact and elevated in proportion to its bulk than the two former buildings, but resembles them in general character, exhibiting a massive basement with porches, and rising above in a pyramidal gradation of terraces, crowned by a spire and *htee*. The latter has broken from its stays at one side, and now leans over almost horizontally, having torn with it the acorn of brick-work which caps the spire, and threatening speedy downfall.



N.E. VIEW OF GAUDA-PALEN TEMPLE.

Photographed from a Drawing by CAPTAIN H. YULE.

From the last terrace, below the spire, we had a noble prospect of the vast field of ruined temples stretching north, east, and south, and Mr. Grant devoted many laborious hours to sketching this panorama.

All these three buildings have been kept in repair, and "beautified" in some churchwarden spirit, more to their loss than gain. One other important temple within the city walls has also been kept in repair. Its date is given by Mr. Crawford as about the year 1200. This is the *Baúddhi** described and delineated by him. It is different in style from the other temples and very inferior in size, majesty, and art. The basement is a quadrangular block of no great height, supporting a tall spire strongly resembling that of the ordinary Hindu shiwala, and still more strongly the *sikra* of the Jain temples near the river Barákar, and of some of the ancient Hindu temples delineated by Mr. Fergusson, such as those at Bhúbaueswar in Orissa and that at Barolli in Rajputáná. The latter, in general effect, has a considerable resemblance to the *Baúddhi* as seen from a distance.† Both base and spire are covered with niches, bearing seated Gautamas, and interspersed with ornamental pannels and mouldings. This gives the building a very rich appearance at a little distance, but, closely viewed, the execution is execrably rough and inaccurate, and there is an absence of the whole spirit of art visible in what I must call the greater and purer works.

In these there is an actual sublimity of architectural effect, which excites wonder, almost awe, and takes hold of the imagination in a manner that renders apology for them as "Burmese," absurdly out of place.‡ There is no such spell in *Baúddhi*, which only recalls the Hindu temple, of which a thousand specimens infinitely superior in material and workmanship are to be seen at Benares

* *Baúddhi* signifies the Banian tree.

† See *Fergusson's Ancient Architecture of Hindustan*, Pl. VII., and Capt. Tripe's Photograph, No. —

‡ "We were all struck with awe" says Mr. Oldham, in his Journal "at the littleness of our individual might in the presence of such evidence of combined power and exertion."

and Mirzapur, to say nothing of the older and finer works in other parts of India, of which I have scarcely any personal knowledge.

Omitting further consideration of the last named building, the architectural elements of which the great temples are composed, and hundreds of smaller ones in the same style, are nearly the same in all, though combined in considerable variety.

The pointed arch is found in all, and is almost universally the form of the doorways. It is, universally, enclosed in a framework, or façade, exhibiting an arch dressing of a triangular or almost parabolic shape, drooping in cusps of a characteristic form, and surmounted by a sort of pediment of graduated flame-like spires and horns of a very peculiar character. This cusped arch and these flamboyant spires and horns are, in a modified form, part of the style of ornament universal in the elaborate timber monasteries of Burma. The style seemed to me more natural in the latter material, and I felt more inclined to believe that the masonry ornamentation had been, (as in so many other climates,) adapted from that of timber, than the architecture of the temples modified to suit the timber structures. This opinion has changed since my return to Calcutta, and access to drawings has enabled me to trace the prototype of this flamboyant ornament in the temples of Southern India. Whether again this pattern did not originate in a preceding timber model is too remote a question. Even in the cave temples of Western India, Mr. Fergusson traces distinctly the limitation of timber construction.

In the greater doorways, this cusped arch face and pediment is generally supported at each side by a semi-arch and semi-pediment of like character, at a lower level.

All these arches and semi-arches rest on regular pilasters with base, capital, and cornice, the singular resemblance of which, both in general character and in many of the details of mouldings, to the pilasters of Roman architecture is startling, perplexing, and unaccountable to me by any theory I have yet heard propounded, if anything like the true date has been assigned to these buildings.

The following extracts from Mr. Oldham's journal well express the feeling with which several members of the mission involuntarily viewed these structures with reference to their origin.

“So strongly unlike all other Burman buildings, can these have owed their origin to the skill of a western Christian or Missionary, who may have adopted largely the ornamentation of the Burmese, and ingrafted much of their detail and their arrangements on his own idea of a temple? May not the true cross-like plan of the Ananda be thus symbolical, and may he not, in the long-trusting hope of a zealous worshipper of Christ, have looked forward to the time when this noble pile might be turned from the worship of an unknown God to the service of the Most High.” “I can’t think any Burman ever designed or planned such buildings. They are opposed to the general plan of their construction. The Shwe Koo [one of the minor temples] might possibly be the work of Burman mind, but I fancy not the others; or, if they did design them, the Burmans of those days were very different from the Burmans of the present day.”

Such an impression, I know, was almost irresistible at times when on the spot. But, without going much into argument on the subject, I cannot think it probably founded in truth. There is not, I believe, reason to believe that any missionaries, or Europeans of any kind, found their way to these trans-gangetic regions in the days when these temples were founded.* If there had been

* At the suggestion of a friend I annex an abstract of the chronology of Burmese intercourse with the west. However imperfect, this abstract, which has been compiled with considerable labour, will be, I trust, interesting, independently of the question of the origin of these temples.

Ptolemy is, I believe, the only ancient geographer who gives any particulars of these countries. He quotes his predecessor Marinus of Tyre (who lived about A. D. 100) as referring to the log of one Alexander, who had voyaged along these shores as far as *Thinae* and *Cattigara*. Great difference of opinion has existed as to the identification of these and the hitherward localities which he names. Some, considering that the Aurea Chersonesus, which was passed in reaching the two places above mentioned, can only answer to the Peninsula of Malacca, have carried their locality as far eastward as the southern extremity of Camboja. But Gosselin* has shewn a strong reason to believe that the Aurea Chersonesus really represents the protuberant Delta of the Irawadee, and that *Thinae* is rather to be

* *Recherches sur la Geographie des anciens, Par P. F. J. Gosselin.* Paris, 1813. Vol. III.

communication we must go further back for it. And the points of resemblance are rather to *Roman* architecture, properly so called,

identified with Tenasserim. There are abundant difficulties in the way of either interpretation.

It is an interesting subject, but a great deal more learning and leisure than I possess would be required to discuss it properly. Two arguments, however, may be mentioned which appear strongly to favour Gosselin's theory. Ptolemy describes the various rivers of the Chersonesus as mutually communicating, a circumstance which could not apply to the Malay Peninsula, but which applies excellently to the waters of the Delta. These rivers, whose embouchures he names Chrysoana, Palanda and Attabas, would therefore be three of the principal outlets of the Irawadee. Again, immediately westward of the Chersonesus he places the Sinus Sabaricus, and in this gulph the mouths of the river Besynga. Now, a little below, in his sketch of the hydrography of India beyond the Ganges, the Geographer says distinctly; "From the range of Mæandrus flow down all the rivers beyond Ganges, *until you come to the river Besynga.*" This remark seems infallibly to identify Mons Mæandrus with the Aracan Yomadoung and the river Besynga with the Bassin branch of the Irawadee.

The Rev. Mr. Mason in his valuable book, "*The Natural Productions of Burma*,"* following the more common arrangement of maps of ancient geography, which makes the Sinus Sabaricus represent the Gulph of Martaban, traces Besynga in the Solwen, called by the Talaings *Be-khung*. But it may be suggested that *Bathein-khyoung* (river of Bassein, in Burmese) affords at least as strong a resemblance. And it is curious that this very gulph of Negrais, which we take to be the Sinus Sabaricus, is called by several of the old travellers "the Sea of Bara."†

Where the data are so vague, attempts at the identification of names are rather amusing than profitable. But a few may be mentioned. *Sada* suits in locality as well as name with Sandoway, which is mentioned at a very early period of Burmese history.‡ *Zabai* has been identified by Gosselin with Tavoy. In Ptolemy's list of inland cities to the north of the Chersonesus occurs the name of *Mareura metropolis*. The identity of this has been suggested§ with the ancient city of *Mauroya*, which, as Col. Burney tells us from the Burman histories, pre-

* Published at Maulmain 1856. See under the head of Ethnology, p. 427.

† Vide Cæsar Frederick in *Purchas*, II. 1717 and Gasparo Balbi, *id.* p. 1724. At the same time, be it said, I feel some misgiving that this *Bara* may be only the *Bar* of Negrais. In Wood's map, at the beginning of Syme's Narrative, one of the mouths of the Irawadee is called *Barago*, and I believe Barago Point is still the name given by mariners to the extreme point of the delta.

‡ See Col. Burney in J. A. S. B. V. 163.

§ By Col. Hannay in his *Sketch of the Singphos*, 1847, p. 32, and by Mr. Mason, I. p. 445.

than to anything of later date, so far as I know, before the fifteenth century. And even this Roman character is so mixed up

ceded Tagoung as the seat of the Sakya kings. Mauroya is now known as Mneyen, a town not far south from Bamó.

In *Tugma metropolis*, an inland city of the Aurea Regio, we have perhaps the venerable city of Tagoung; in *Tharra*, an inland city of the Chersonesus, Tharawadee, or perhaps Thare-khettara, the ancient name of Prome; *Satyrorum Promontorium* we might be tempted to find in the point of Bilú-gyoon or Ogre's Island, off Maulmain. At the northern confines of Mons Mæandrus, Ptolemy, true to this day, places the *Nanga logæ* or Nága Lóg, which he defines as truly to mean 'the Naked Folk.' Eastward towards the Sinæ are the Kakobæ, whom Col. Hannay* finds in the Ka-khyens called by themselves Kakoos; and near the shores of the Magnns Sinns we find the Kadopæ or Kadotæ who may be the Karens, called in the Talaing language, according to F. Buchanan, *Kadoon*. Beyond them we get among tribes of Pirates, who are said to have skin like that of a hippopotamns, not penetrable by arrows; so we may decline to follow Ptolemy any further. It may be noted that though the geographer characterises several tribes in these parts as Anthropophagi, he affixes "Emporium" to the names of various places on the coast, which seems to indicate civilization and foreign trade.

Why these lands should have been termed the lands of silver and gold (*Argentea Regio*, *Aurea Regio*, *Chersonesus Aurea*) may appear obscure, as they are not now remarkably productive of those metals. There are, however, gold-washings on a small scale in many of the rivulets both of Pegu and of the valley of the upper Irawadee and of the Kyendwen, which may have been more productive in ancient times. And the *Argentea Regio* may probably (as suggested by Col. Hannay†) have been the territory including the *Bau-Dwen*, or great silver mine on the Chinese frontier, which is believed to supply a large part of the currency of Burma. Indeed *Aurea Regio* may be only a translation of the name *Sonaparanta*, which is the classic or sacred appellation of the central region of Burma between the Irawadee and the Kyendwen, always used to this day in the enumeration of the king's titles. These regions may moreover have been the channels by which the precious metals were brought from China, and the mountains near the sources of the Irawadee which are said to be very productive of gold, and possibly even at that remote period the profuse use of gilding in edifices may have characterised the people, as it does now.

It seems, however, most probable that this practice was introduced with Buddhism.‡ Yet even at the period of the first Buddhist mission to this region,

* As above p. 2.

† Ditto.

‡ The elaborate gilding of chapels and monastic cells in India and central Asia is mentioned by Fahian, the Chinese pilgrim in the fifth century. (See *Laidlay's translation*, p. 18, &c.)

and blended with other touches and details so utterly un-Roman and original, that one cannot conceive so spirited and effective a fusion to have been produced by any chance European aid.

at the conclusion of the third great synod, B. C. 241, it was known in India as "*Suvarna Bhumi*" the Golden Land.*

According to Mr. Mason, the ancient capital of the Talaings (of the Tounghthoos according to the tradition of the latter) was Thadung, or Satung, a city whose traces still exist between the mouths of the Salwen and the Sitang. *Suvanna-bumme*, he adds, but unfortunately stating no authority, is still the classic Pali name of Satung.†

In the beginning of the fifth century, Buddhaghosa, a Bramin of Magadha, visited Ceylon and there revised the Buddhist scriptures and re-translated them into Pali. He carried his version with him to Pegu, and there made it known. In A. D. 1171, a mission was sent from Burma to Ceylon, and ten years subsequently five men deeply versed in the Burmese scriptures came from Ceylon to Pagán. One of the number is said to have been a Cambojan, and another a Cingalese.‡

The intercourse with Ceylon appears to have continued more or less till a late period. It was not always an intercourse of merely a religious character. In one instance, more particularly referred to at page 55 of the text, we find a king of Ceylon carrying a hostile armament against the Burman countries (A. D. 1153); § and in another we find 'Brama, king of Pegu,' as he was called by the Portuguese, sending to solicit the daughter of a king of Ceylon in marriage (about 1566.)||

It is scarcely possible that any intercourse should go on at the present day, if we may judge by the surprise and incredulity of the Burmese courtiers when told by Major Phayre that the sacred island of Lankadwipa also belonged to the English. The last remarkable instance of intercommunication between Ceylon and Burma, of which, I am aware, occurred towards the end of the last century,

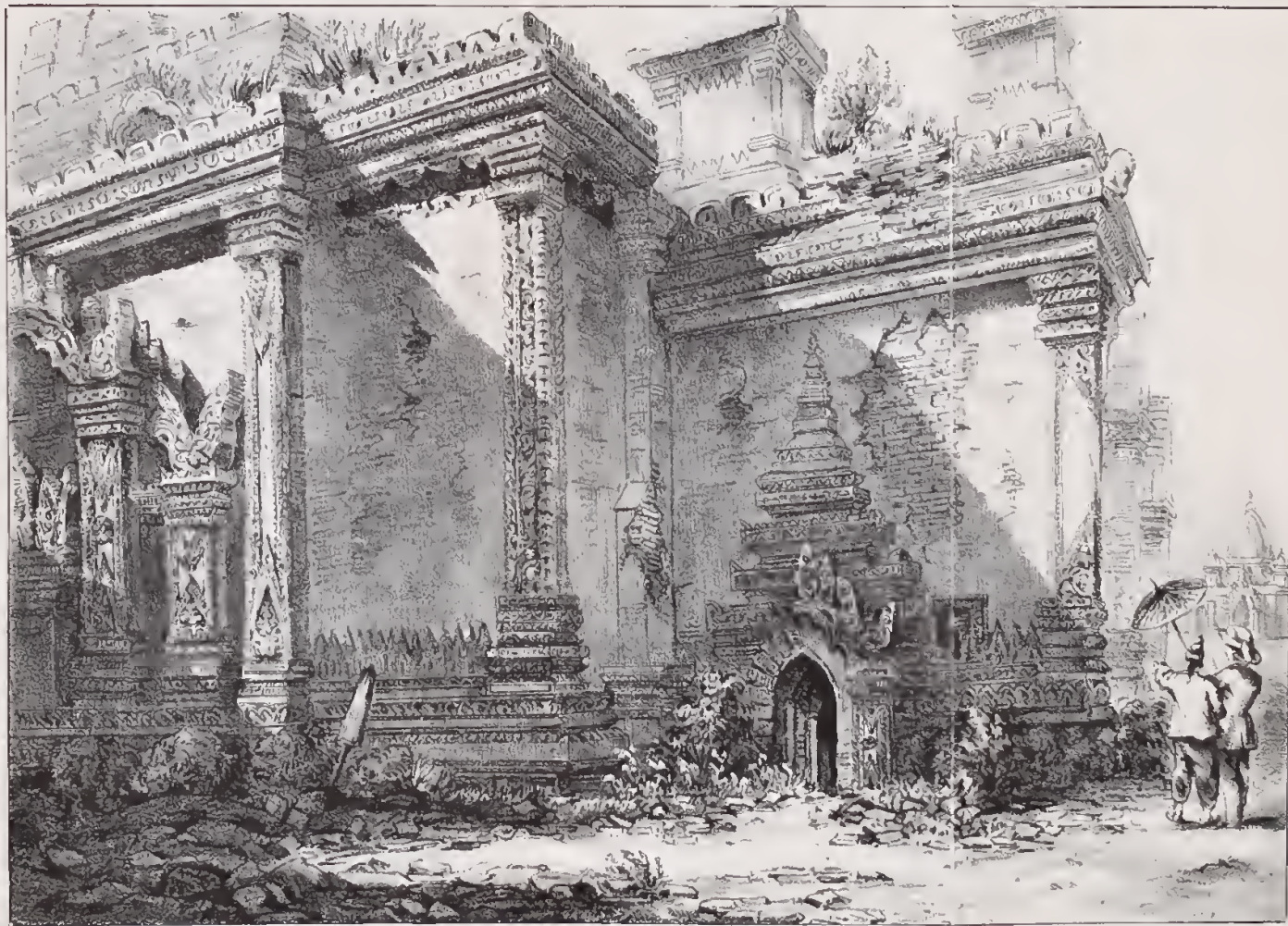
* "Sono and Uttaro were deputed to *Suvarna Bhumi* or Golden Land. As this country was on the sea-coast, it may be identified either with Ava, the *Aurea Regio*, or with Siam the *Aurea Chersonesus*, 6,000,000 of people are said to have been converted, of whom 25,000 men became monks, and 1500 women became nuns." Quoted from the *Mahawanso* by Major Cunningham in his *Bhilsa Topes*, p. 118.

† *Mason*, as above p. 427. He also says that Maubee in the delta of the *Irawadee* was called *Suvanna nadee*, River of gold. *Sobana* emporium and *Sobanas* occur as the names of a town and river in Ptolemy's list. And *Chrysoanas*, his name for one of the rivers of the delta, looks like a translation of the same.

‡ *Mason*—p. 453.

§ It is curious that in the reign of the preceding monarch of Burma, *Alountsee-thoo*, it is said in the chronicles that "the governors of Bassein, of other districts in the Talaing country, the *Kala governor of the island of Ceylon*, and he of *Tenasserim*, having rebelled, were put down, and their countries taken possession of." (*Mason*, as above.)

|| *Hist. of the discovery and conquest of India by the Portuguese*, London, 1695.



TEMPLE CALLED SENPHYOKOO AT PAGAN.
Photographed from a Drawing by CAPTAIN H. YULE.

Engraved by H. M. Smith at the Survey Genl's Office, Calcutta May 1857

To return to details. The angles of all the chief buildings are when the maintenance of caste-distinctions among the priesthood by the kings of Candy, provoked the low-caste monks to organize an expedition to the orthodox Buddhists of Burma, with a view to the restoration of equal rights.

That religious visits were made during the middle ages of the Burmese countries to the sacred spots of Buddhism in India, is proved by an inscription in Burmese at Buddha-Gaya, discovered by the Burmese envoys who were sent to Lord W. Bentinck in 1831-33. Some doubt attaches to the reading of the date and the determination of the king whose repair of the temple it commemorates. Burney ascribed it to the reign of Aloungtsec-thoo, A. D. 1105.

There is no mention of Pegu, by the Mahomedans of the 9th century, whose travels were published by the Abbé Renaudot and are given in Pinkerton's and various other collections, nor so far as I can learn by any Western traveller till the time of Marco Polo.

Indeed, the first opening for Christian travellers into Asia was in quite another direction, and much further to the North. Monks of Italy, France and Flanders jostled each other at the court of Kara Korum; and Mongol ambassadors found their way to Paris and Northampton,* when as yet all that Europe knew of India was derived from Strabo and Arrian.

It is probably Pagán which Marco Polo speaks of under the name of Mien, "a great and noble city, the head of the kingdom." *Mien* is said by Col. Burney to be the Chinese name of Burma.† But Marco does not speak as if he had himself been in the country, and there is only one unmistakably Burmese feature in his story. This is in the description of two towers in pyramid fashion which a certain king caused to be built near his sepulchre; "upon the top, round about the balls" he says, "many little gold and silver bells were hanged, which at the blowing of the wind give a certain sound." The date of the expedition which Marco Polo relates is between A. D. 1272 and 1290.

In 1444, Nicolo di Conti,‡ a Venetian, returned from five and twenty years' travelling in the East. He visited Racha (Aracan) on a river of the same name, and thence "after seventeen days passing desert hills, came into a champaign country." He must therefore have gone over the Aeng pass, or some other pass of the Aracan Yoma. He speaks of the river of Ava, as greater than the Ganges; the city of Ava, as fifteen miles in circuit, &c., the kingdom itself he calls Macin

* Rémusat, *Mémoire sur les Relations Politiques des Princes Chrétiens, &c. avec les Empereurs Mongols*, 1824, p. 154.

† J. A. S. B. IV. 400. Dr. Buchanan says that the Chinese of Yunnan call the Burmese *Lau meen*, As. Res. V. 223. In DuHalde's Maps, a distinction is made between the kingdoms of *Yaoua* and *Mien*.

‡ *Ramusio*, I. 340. The narrative is very imperfect, which is to be regretted, as it bears the stamp of honesty. A few additional particulars are given in Purchas, II. 159, from another version of di Conti's travels.

formed into pilasters such as we have spoken of supporting a regular (*Maha-chin* doubtless, a name often applied in India to the little known Eastern kingdoms indiscriminately). He is the first traveller, I believe, who mentions the white elephant, and the name of Ava, which has not existed a century.* He speaks also of the Burmese fashion of tattooing the body, as common both with men and women. The latter do not now practise it, though among their Khyen neighbours it is almost confined to the women.

Di Conti makes the singular statement that the people in their daily prayer said, "God in Trinity keep us in his Law." This, which at first sight looks like fiction, is really an evidence of his veracity. He had doubtless heard of "the three precious ones," the triad of *Buddha*, *Dharma*, and *Sanga*, the Buddha, the Law, and the Clergy; (see note by Rémusat in *Pilgrimage of Fa-lian*, Cal. 1848, p. 42).†

In 1496, Pegu was visited by Hieronymo da Santo Stephano, a Genoese, who is, I believe, the first European by whom Pegu is distinctly mentioned. He speaks of it as a great city ruled by a "Gran Signore" who possessed 10,000 elephants. He was prevented from visiting Ava by war between the two nations.‡

About the same time or a little later, we find at Pegu another traveller, Lodovico Barthema of Bologna. He gives few interesting particulars, but mentions "great canes" (bamboos) "as large as a barrel," and like all the travellers to these parts, speaks much of the rubies, the original locality of which they all assign to a city, or mountainous region called Caplan, beyond Ava. He also speaks of Pegu and Ava as at war.§

With the extension of European discovery in the beginning of the 16th century, European traders and Portuguese adventurers began to haunt the coasts of Pegu. The first Portuguese traveller known to us is Ruy Nunez d'Acunha, who was sent thither by Alphonso d'Albuquerque in 1511.||

* He is also the first traveller who mentions a strange, obscene, and barbarous custom, which is spoken of so repeatedly by all travellers during the next 200 years, that it seems impossible to doubt its having existed, though I believe there is not now the slightest trace of it; unless the practice be so, which some of the Burmese warriors are said to retain, of inserting a piece of metal under the flesh to make themselves invulnerable. Some old travellers ascribe to the Siamese and Shans as well as the Burmese, the custom alluded to. The prevalence of such a custom seems a strong corroboration of the idea expressed by Ritter (*Erdkunde* V. 171,) that the Burmans have not long emerged from barbarism. There is a deep element of barbarism in the Burman character, but looking to Pagán and other evidences, it may be doubted whether their civilization, such as it is, was not fully greater eight centuries ago, than one century ago. The modified practice referred to above is witnessed to by Mr. Howard Malcom, who was allowed by one of the Christian converts at Ava to take several amulets of gold from under the skin of his arm. (I. 307.)

† In the letter which the king of Ava wrote to the Governor General in 1830, His Majesty speaks of his "observing the three objects of worship, namely, God, his precepts, and his attendant or priests," (Buddha, Dharma and Sanga.)

‡ *Ramusio Navigazioni et Viaggi*, Venetia MDLXIII. I. p. 345.

§ Ditto Ditto, p. 165.

|| *Purchas*, II. 1681.

lar and bold cornice, and resting on a regular and varied series of

The travels of Odoardo Barbosa to this coast about 1520 are given in Ramusio's collection. He speaks of "Verna" as a distinct kingdom from Ava, as many later travellers do. Apparently Toungoo is meant.*

About the same time Antony Correa was sent by the Portuguese to negotiate a treaty with the King of Pegu.†

The celebrated Ferdinand Mendez Pinto was in these countries as a military adventurer in 1545, and professes to have been present at the sieges of Martaban and Prome. His relations are full of extravagant statements, and a great deal of his geography is probably absolute invention. Still it is evident that he was in the country. Among names still easily recognizable which he mentions, are Dalaa (Dalla near the coast of the Delta), Digon (Dagon, *i. e.* Rangoon), the Province of Danaplu (Danobyu), Ansedá (Henzada), and Meletay (Meaday). The last he correctly describes as a fortress twelve leagues up the river from Prome.‡

Many of the old maps depict a certain "Lake of Chimay" somewhere in the far interior of the Indo-Chinese countries, whence issue all the great rivers of Eastern India.§ But Ferdinand Mendez is probably the only traveller who declares he had *seen* it. He gives it, however, a different name.

During the constant wars that went on between Siam, Pegu, Toungoo, Ava, and Arracan, during this century, some Portuguese partisans appear generally to have been found on either side. Thus in 1544, when Martabau was besieged by "Pará Mandará (as he is called by the Portuguese writers)|| king of the Burmas" (*i. e.* of Toungoo),¶ we find among his force some galleys manned by Portuguese under John Cayero, and five years later when the same prince invaded Siam and attacked the capital, he had with him 180 Portuguese under James Surez de Melo, whilst the king of Siam in his besieged city of Odio* had 50 Portuguese under James Pereyra.†

Some years later when this conquering king of the Burmas had been murdered

* *Ramusio*, p. 316.

† *Modern Universal History*, VI. 162.

‡ Elsewhere he speaks of the *kingdom* of Meletay, which other travellers have reproduced as a kingdom of *Melintay*. It is curious that Malanda is one of Ptolemy's names for an inland city in this region.

§ Such a notion seems to have been generally diffused, probably from India with the Buddhist legends. Doubtless it originated in the fact of the rise of the Indus, the Sutlej, the Ganges, and the Tsanpoo within a space of little more than two square degrees from that great world-water-shed on which lake Mansarowar lies.

|| Probably Men-tara-gyee Phra, a common appellation of Burmese monarchs.

¶ According to the history consulted by Sangermano, the kingdom of Toungoo was founded by a Prince of Pagán in 1252. The conqueror, Pará Mandará, whom Sangermano calls Mentrasvedi, was the thirtieth prince of the line.

* Odia or Yuthia, the former capital of Siam, above Bangkok.

† *History of the Discovery and Conquest of India by the Portuguese*. London, 1695. II. 134-8.

basement mouldings which run all round the building.

by the "Shemîn of Satân," (Sitang or perhaps Thadung), and the latter contested the throne with a member of the old royal house of Pegu, whom the Portuguese call Shemindoo, he was killed before Pegu by the fortunate shot from the musket of Gonzalo Neto. But in 1552 a second prince of Toungoo again got possession of Pegu. This is the king called by the old writers Aleagar, or "Brama king of Pegu,"* who extended his conquests over Ava, Mogoung, Jangomai (Zimmé), the west of Yunnan, and other adjoining states, and the wealth and splendour of whose court made Pegu so famous in Europe as an empire of fabulous magnificence.

Casper de Cruz, a Dominican, appears to have been to the East between 1550 and 1560. He speaks of the "Brames" as "a great people, very rich of gold and precious stones; chiefly of rubies; a proud and valiant nation. *The country very scarce of victuals.* They wear their clothes painted or wrought. They are somewhat like the Chinas in their faces; they have very rich gallant shippings garnished with gold, in which they sail in the rivers; they use vessels of gold and of silver; their houses are of timber very well wrought. The kingdom is very great. They have not commonly war with the Chinas, because of the great mountains that are between the one and the other, and because the Chinas are well fortified on that side,"† &c. All which is very accurate.

In 1557, Bomferrus a Dominican missionary returned from Pegu. He had spent three years in learning their language and mysteries, that he might preach among them, "but was soon forced to give over and return into India; for they could not endure to hear any better knowledge than they had."‡ This missionary appears to have given a tolerable account of Buddhism as it exists in these countries.

In 1569, Cæsar Frederick, a Venetian merchant, was in Pegu, and gave a very interesting account of that country. That same "Brama of Toungoo" was on the throne, who was said to have twenty and six crowned heads at his command, and to be able to bring into the field a million and a half of men of war!§ "For people, dominions, gold and silver" Mr. Frederick hesitates not to say, "he far excels the power of the Great Turk, in treasure and strength."

These expressions seem utterly preposterous, when we see what Pegu and Burma are in our day. All the old travellers use similar superlative terms in speak-

* His name in Burmese history is Tshen-byu-mya-yen "Lord of many white elephants." He is the personage called by Pinto, "The Chaumigrem." "He was born on a Wednesday" says the chronicle, "and on the day of his death the great Pagoda fell into ruins, an inundation covered the whole city, and a shower of rubies fell from heaven." (*Sangermano*, p. 45.)

† In *Purchas*, III. p. 169.

‡ *Purchas*, V. p. 507. This Friar according to Sir Thomas Herbert, "came home professing that he had rather with St. Anthony preach among pigs than among such a swinish generation." *Herbert's Travels*, p. 359.

§ That is, more than twice the whole population of the British province of Pegu in 1856.

These cornices and basements are, in almost all the buildings,

ing of the Peguan monarchy at this time. Yet Frederick, and Fitch who followed him a few years later, are men who give a sober and true account of other matters, in which we still may compare their descriptions with facts as they are.*

It may perhaps be remarked that only at the end of the last century the spectacles of Col. Symes appear to have shewn him in Burma a magnificent and civilised empire, including a population which he estimated at seventeen millions. Later experience has proved that the Colonel's view of the magnificence and civilisation was as exaggerated as his estimate of the population.

But making allowance for a similar tendency to the over-estimation of so distant a region by the older travellers, in reading their narratives it is impossible to resist the conviction that the lower provinces at least of the Irawadee exhibited in the 16th century a much more flourishing and wealthy community than now exists in the delta, and we have, in the subsequent history of the country, the causes of a great deterioration. The splendour of the Peguan monarchy was very short-lived. In the time of the son of the conquering prince came a succession of internal and external wars, during which the country was harassed and devastated, both by the cruelties of the savage king, and by invasions from Arracan, Siam, Toungoo and Ava, by all which Pegu was reduced to the depths of desolation and misery; insomuch that Purchas, in a curious chapter "on the destruction and desolation of Pegu,"† collected from the writings of numerous eye-witnesses his contemporaries, thinks it appropriate to observe, that "the natives of Pegu are not quite extinct, but many of them are fled into other kingdoms." Notices of the history of Pegu are defective during the greater part of the 17th century, and I do not know what further wars took place during that period. But towards the middle of the century following came its temporary re-assertion of independence and even of supremacy, and its rapidly succeeding subjection to the vengeance of Alompra. It is not surprising that Pegu should never have recovered from calamities so repeated and disastrous. History scarcely justifies the expectation that countries should recover, even in long periods of comparative repose, from such universal and thorough devastation. And the habits of the Burman races are not favourable to increase of population. A singularly small portion of their children live to maturity.‡

* See for instance Frederick's vivid and accurate account of the bore in the Sitang, (*Purchas*, II. 1716,) which I have lately had the opportunity of comparing with that of a good observer, Mr. T. Login.

† V. p. 500.

‡ I have just read in the course of my ordinary duties a report by Mr. T. Login on a projected canal to the Sitang, from the Pegu river at a point below the ancient capital. He speaks incidentally of traces of extensive cultivation in tracts which now scarcely shew two souls to the square mile. The vast ruined pagoda of Mahkau, of which Mr. Login speaks in the same report, doubtless represents the site of the castle of Maccao, mentioned by the old travellers as

formed of the same succession of members, but it is only from the

Returning from this digression, we find in 1583 Gasparo Balbi, a jeweller of Venice, visiting Pegu with a stock of emeralds. As with all the travellers about this period, his ship made a port in the river of Bassein or one of its channels, called by them Cosmi or Cosmin,* which seems at that time, distant as it was from the capital, to have been the principal port of Pegu.

In entering the Bassein river his description of the gilded beacon temple of Modaen on Pagoda point, and of the swarms of flies attracted by the *ngapee* manufacture at Negrais, are pleasant to read in their graphic truth, after three centuries nearly have past.

From Cosmiu the travellers appear to have taken a route through the ramified channels of the lower Delta, and Balbi mentions several great and fair cities by the way.† In seven days they reached Dalla (near the mouth of the Rangoon river,) and next day the "citie of Dogon" (Rangoon,) where he describes the great Pagoda, &c., in a manner still very recognizable.

Mr. Ralph Fitch, merchant of London, is the first Englishman who has given an account of a visit to Pegu. He follows the same route as the last traveller, by Cosmin to Dalla, Sirian and Pegu.

Fitch's account of the capital appears to be borrowed to some extent from that of his predecessor Frederick, which I have partly extracted in illustration of my description of Amarapoorā.‡ From Pegu he extended his travels to "Iamahey which is in the country of the Langeiaunes whom we call Iangomes; it is five and twenty days' journey north-east from Pegu." This Iamahey or Jamahey is undoubtedly the Shan town of Zimmé, which has been very rarely reached by any European traveller in modern times. Fitch describes it as "a

the place where goods for the royal city were discharged; and where the king had his gardens and his boat-races.

During the three years that have elapsed since the war that terminated in the annexation of Pegu, in some of the districts which, directly or indirectly suffered most, such as Padaung and Meudoon (West and North-west of Prome) scarcely any favourable reaction has taken place.

The writer had an opportunity of seeing the state of the former small district between the Arracan hills and the Irawadee, once covered with beautiful and thriving towns and villages, in travelling from the Arracan coast to Prome in March 1853, just as the war was closing. And one may conceive how deadly and enduring would be the results of war, repeated year after year in such a country, by various hosts of barbarians. Such, all these races eminently are in war, whatever they may be in peace.

* I had always supposed from the narratives that Cosmin must have been Bassein itself. But in Wood's map (1795), the last which gives the name, Cosmin is placed on another channel, to the eastward of the main Bassein river.

† Frederick states that at all the villages on this route "hennes, pigeons, eggs, milke, rice, and other things be very good and cheape;" a very different state of things from the present, when our hungry surveyors complain that they can get neither "Hennes" nor eggs, let alone "other things" for love or money.

‡ See Major Phayre's Mission to Ava page 160, (unpublished.)

study and comparison of the remains of the unrepared and unbar-

very faire and great Towne with faire houses of stone," which is remarkable, if true.

From the accounts of all the travellers of this period we derive the impression of a thriving trade in the ports of Pegu. Martaban, we are told by Frederick and Fitch, was frequented by many ships from Malacca, Sirian by ships from Mecca (Mocha probably) and Achen, Cosmin by ships from Bengal, St. Thomé (Madras) and Masulipatam.

Fitch was at Pegu in the end of 1586, and the kingdom seems still to have stood in its glory.*

But only eleven years later, in 1598, Nicholas Pimenta, Visitor of the Jesuits in India, relates the destruction of the Peguan monarchy, and the miserable state of the country, as reported to him by ships which arrived at St. Thomé when he was organizing a Mission for Pegu.

In March 1600, Boves, another Jesuit, writes that he was in the country when the king besieged by the kings of Arracan and Toungoo surrendered, and was put to death. "It is a lamentable spectacle," says the Padre, "to see the banks of the rivers, set with infinite fruit-bearing trees, now overwhelmed with ruins of gilded temples and noble edifices; the ways and fields full of skulls and bones of wretched Peguans, killed or famished, and cast into the river in such numbers that the multitude of carcases prohibiteth the way and passage of any ships; to omit the burnings and massacres committed by this, the cruellest tyrant that ever breathed."†

After his victory, the king of Arracan made over the port of Syrian to Philip de Brito, a Portuguese partisan leader.‡ De Brito, however, quarrelled with the king of Arracan, and went to Goa to obtain the support of the Viceroy. During his absence his followers proclaimed him king of Pegu. He continued to carry things with a high hand for some years, capturing the son of his former patron the king of Arracan, for whom he demanded a ransom of 50,000 crowns;§ and sometime afterwards he treacherously seized the person and treasure of the king of Toungoo,|| with whom he had made alliance. In 1610 a traveller says of de Brito; "He yet also domineereth and careth for nobodie."¶ He had married his son Simon to a daughter of the king of Martaban,* which province had appa-

* *Purchas*, Vol. II.

† Boves in *Purchas*, II. 1748.

‡ Do. Do.

§ *Hist. of Disc. and Conq. of India by the Portuguese*, III. 138 etc. and *Purchas*, V. p. 514.

|| Hence called by the Burmese *Kala-ya-men*, "The king whom the Kalás seized." *Col. Burney in J. A. S. B.* IV. 404.

¶ *Relations of strange occurrents* by Peter Williamson Floris; in *Purchas*, I. 322.

* *Hist. of Discov. and Conq.* as above.

barized temples that their full intention and true character can be

rently risen again to brief independence during the anarchy which succeeded the fall of the Peguan monarchy.

In 1613, however, the king of Ava appeared on the field, and with a large army besieged de Brito in Sirian, where the Portuguese leader made a desperate defence. The king of Arracan, whom he had so grievously offended, sent 50 vessels to his assistance, but they were captured by the Burmans. At last de Brito was betrayed and carried to the king, who caused him to be "spitted," or impaled, and set up on an eminence overlooking the Fort. In such misery he continued to live for two days. His wife Donna Luisa de Saldanha was sent to Ava with the other captives.*

The dominance of Ava over the lower provinces dates from this time.

The king after having been crowned at Pegu, sent his brother to master the southern states. He soon conquered Tavoy, and proceeded to besiege Tenneserim. Here Christopher Rebello, an outlaw from Cochin, with 40 Portuguese and 70 slaves, in four galliots, attacked and routed the Burmese flotilla of 500 vessels.†

A short time afterwards the king of Ava, fearing the vengeance of the Portuguese, should they unite with his rivals of Arracan and Siam, sent ambassadors (to Goa apparently) to the Portuguese Viceroy, to apologise for the killing of de Brito, and offering to join in an attack on Arracan. The Viceroy agreed, and sent an envoy in turn, but he was treated with true Burman nonchalance, and nothing resulted.‡

Though Mr. Fitch, and possibly other wandering English merchants, had visited Pegu in the preceding century, no English convoy had at that time come to the Indian seas for trade. The East India Company was first established in 1599, when Pegu was in the depths of its desolation. Hence, though our trade had spread far to the eastward, no attempt at intercourse with the Irawadee delta had taken place up to 1618. Curiously enough, the first intercourse originated from the eastward. A year or two before the period named, the English factor at Siam, Lucas Anthonison by name, sent one Thomas Samuel to Zengomay (Zimmé),§ to inquire into the prospects of trade there. Zimmé had been subject to the great king of Pegu, but during the misfortunes of that monarchy in his son's time, had been taken by the Siamese. The king of Ava, whose power had risen, as we have seen, on the fall of Pegu, and who was extending his conquests over most of the provinces that had been subject to the latter, obtained possession of Zimmé whilst Samuel was there, and carried him, with other foreigners, to Pegu. There he died, and his property was seized by the king.

* *Hist. of Disc.* as above, III. 191. See also *Modern Universal Histy.* (1781,) vol. VI. p. 202; and *Purchas*, V. 502 and 514.

† *Hist. of Disc.* as above, III. p. 197.

‡ *Hist. of Disc. &c.* p. 255.

§ Called by the Siamese Chang-mai.

made out.*

Every main cornice, for instance, is crowned with a sort of battle-

The relator, William Methold, in the supplement to Purchas's Pilgrims, calls the monarch king of Pegu, and at Pegu he appears to have held his court. But he was in fact properly the king of Ava.

News was brought of Samuel's death to Masulipatam where Lucas Anthonison happened now to be factor for the Company. He took the opportunity of sending two agents carrying a letter and present for the king, professedly to apply for the restoration of Samuel's effects, but also with a small adventure to make trial of the trade.

The agents were unfaithful. They misappropriated the proceeds of the trade, and wrote most discouraging accounts of their treatment. But they were sent back in April 1619, with most of Samuel's property, as well as a present from the king and a letter inviting trade.*

The history at this period is very obscure, but it would appear that soon after the time mentioned, British intercourse with the Burman countries became more free than it ever was again up to the annexation of Pegu. Dalrymple ascertained from old documents at Fort St. George, that the English had settlements† at Pröme and Ava, as well as at Sirian, and even at a place on the borders of China, which he conjectures to have been Bamó. The Dutch, who had a considerable trade with Burma, likewise possessed factories in the Upper Provinces, and are said to have been at this time in occupation of Negrals.

On some dispute with the Burmese Government, the Dutch threatened, or attempted, to invite the interference of the Chinese. On this, both Dutch and English were ejected.‡

In 1658 or 1659, when a Chinese force invaded Burma, and attacked the capital, the guns on the ramparts of Ava are said to have been served by a party of native Christians under a foreigner named *Methari Kátan*, a name which Col. Burney happily suggests to be intended for "Mr. Cotton."§

* A small but beautiful example of the Pagán architecture in its typical form is the *Sembyo-Kú* or "Cave of the white Elephant."

* Methold in Purchas, V. 1006.

† He says at the beginning of the 17th century. But it could not have been earlier than the circumstances mentioned by Methold.

‡ This is Dalrymple's account. I find, however, in Valentyn's great "Beschryving van Oost Indien," or Description of the Dutch East Indies, (Dordrecht and Amsterdam 1726) vol. V. pt. II. p. 126, that the Dutch had a factory at Sirian from about 1631 till 1677, with subordinate factories at Ava and other places. The Dutch Government of Coromandel sent several embassies to Ava also. Valentyn ascribes the breaking up of the trade to the constant wars that were going on in those regions.

§ J. A. S. B. VI. 126.

mented parapet assuming in the repaired buildings a coarse incongruous appearance in rude plaster-work. In the temples which

The trade seems to have revived towards the end of the century. In 1680 and 1684, the Company's agents had made unsuccessful attempts to re-establish factories in Burma or Pegu. In 1686-7 their attention was turned to Negrais; a survey was made of the island, and it was taken nominal possession of.

In 1695, Nathaniel Higginson, governor of Fort St. George, sent Mr. Edward Fleetwood and Captain James Lesly as envoys to the court of Ava. Their objects were to obtain the settlement of a factory at Sirian, the release of English captives, and of a sloop belonging to one Bartholomew Rodriguez, which had been confiscated, and the restoration of the effects of one Adrian Tilbury, a merchant of Fort St. George, who had died at Martaban.

They carried presents to the amount of about 1000 pagodas, and a letter from Governor Higginson, written in a very humble style. The presents were a regular mercantile speculation. The envoys were to try to get as much as possible in return, "asking for more" if they found it feasible, and were themselves to get ten per cent. on the proceeds as an incitement to do their best.*

Mr. Fleetwood does not appear to have been a gentleman likely either to impress the Burmese court with an exalted impression of his country, or to bring back with him any interesting particulars of theirs. He seemed to think he had made a great *coup* in providing himself with a letter of introduction to the king's mistress. The mission had as little success as it deserved under such auspices, but the re-establishment of the factory at Sirian was conceded. Two years later (1697) Mr. Bowyear was sent as chief of the factory at Sirian, and with a mission to the court similar in its objects to Fleetwood's. It appears from the instructions that the return-presents made to Fleetwood's mission had been profitable to Mr. Higginson, and he was not indisposed to repeat the speculation. But he honourably adds; "If the returns of the present shall stand in competition with, or hinder, the restoring of Bartholomew Rodriguez his cargo, I had rather forego the receiving of any returns for the present, than hinder the restoration of the cargo." No record of Bowyear's mission has been found, and it is probable that he did not proceed to Ava, as the king died just after his arrival in the country.†

In 1709, a Mr. Richard Alison or Allanson was sent as envoy to Ava. No account of his mission has ever been printed. It appears from Hamilton's 'New account of the East Indies'‡ that this gentleman was twice deputed to the court of Ava. But the date of his other mission is unknown. From this point I shall

* Higginson's Instructions to Fleetwood. In Dabrymple's Oriental Repertory, II. p. 337 et seq.

† Bayfield; see below.

‡ Edinburgh, 1727, Vol. II.

remain in their original state, such as *Sudha Muni* (of which I have unfortunately no drawings,) and *Sembyo-kú* we find these

content myself mainly with a brief note of events, as the remaining history of British intercourse with Burma has been fully related in a very able and interesting paper by Dr. Bayfield, which is printed in the appendix to Pemberton's Report on the Eastern Frontier.*

The agent of the Company at Sirian, Mr. Smart, appears to have acted with duplicity during the contests of the Burmese and Peguans for the possession of Pegu, which ended in the temporary supremacy of the latter. In 1743, the factory was burnt by them, and the establishment was withdrawn.

In 1752, the king of Tavoy, then for a short time independent, invited an establishment. But his terms were unreasonable, and no movement was made to act on his offer.

In 1753, a factory was established on Negrais, which was in fact taken possession of in the Company's name.

In 1755, we find a factory under Captain Baker existing at Negrais, during the continued contests between Peguans and Burmese, the latter being again in the ascendant. The chief at Negrais urged on his Government that we should take a decided part with the Burmans. But, about the same time, some English ships at Dagon (Rangoon) took part with the Peguans.

In July of this year, Captain Baker and Lieut. North (who died at Pagán on the way up) were sent by the resident at Negrais on an embassy to Alompra at Mout-sho-bo. The usurper laughed at the idea of assistance from the English, and the mission had no result. Captain Baker took observations on his way, and made a map of the river, which is given by Dalrymple.

In 1751, Dupleix the Governor General of French India had sent an ambassador to the king of Pegu, and obtained the concession of a factory at Sirian. But in 1756, the Government at Pondicherry, contrary to an engagement of neutrality into which the factory had entered with Alompra, having sent succours to the Peguans, and these having fallen into the hands of the conqueror, he massacred the officers, and carried the rest of the French as prisoners to Ava.† From these prisoners some of the Burman Christians of the Dibayen district are said to be descended.

* "Historical Review of the Political relations between the British Government in India and the Empire of Ava, from the earliest date on record to the present year; compiled by G. T. Bayfield, acting assistant to the Resident in Ava, and revised by Lt.-Col. Burney. Ava, 15th December, 1834."

For the facts of the remaining history, I have made free use of this Review. The original authorities are, for the times of Alompra, Dalrymple's *Oriental Repertory*; for Symes's first Mission and Crawford's, their published narratives; for the other Missions, the original papers in the records of the Indian Government. Where I have used other authorities they are referred to.

† *Sonnerat, Voyage aux Indes Orientales*. Paris 1806, III. 5.

battlements to be but the settings of embossed and glazed, and sometimes also richly coloured, tiles, which in fact must have

In 1757, Alompra addressed a letter to the king of England, written on gold adorned with rubies, which he delivered to a Mr. Dyer and others who visited him at Rangoon.

In June of the same year Lieut. Newton, who was in charge of Negrais, deputed Ensign Lister to go to the king with the pompous title of ambassador extraordinary. He overtook Alompra on the river going up from Rangoon, and by dint of some considerable bribery obtained the king's signature to a treaty conceding in perpetuity Negrais, and ground for a factory at Bassein, with freedom of trade, in return for a pledge of military assistance from the Company against the king's enemies. This treaty had never any practical effect.

1759. The greater part of the establishment at Negrais was withdrawn. And on the 6th October in that year the whole of the remaining Europeans, with many natives, were treacherously massacred by the Burmese. The king was said to have suspected that the factory had been in communication with his enemies the Peguans.*

In 1760, Captain Alves was sent with letters and presents from Holwell, Governor of Fort William, and Pigot, Governor of Madras, to demand satisfaction for the massacre, and liberty for the prisoners. Alompra had died on his Siamese expedition a few months before Captain Alves's arrival at Ava. He found the city in rebellion, and the new king besieging it. He was plundered and otherwise shamelessly treated. The prisoners were released, but the idea of satisfaction was scouted, and Ensign Lister's treaty was ignored.

The factory at Bassein was never re-established, but one appears to have been kept up at Rangoon at least till 1782.

In 1769, the French East India Company sent an envoy to the court of Alompra's son Senphyoo-yen,† with the view of re-establishing their trade. They obtained from the king the grant of a factory and other privileges, but these concessions were never acted on.‡

1794. The Burmese, who had conquered Aracan in 1783 began to make inso-

* On the shore of the mainland, close to the north of Negrais is now being laid out the new Port of Dalhousie. "The whirligig of Time has brought about its revenges. The kingdom of Pegu, which the rough hunter conquered, has past from his house to the hands of that power whose servants he treacherously slew; and the city that will rise on the site of his crime will borrow a name from the woody dells of Esk." *Blackwood's Magazine*, May 1856.

† Called by Sonnerat "Zekin-médou," the Shembuan of Symes.

‡ *Sonnerat*, as above, p. 8. This author, whose voyages took place between 1774 and 1781, has a dissertation on the advantages of taking possession of Pegu, for which he calculates that 1000 or 1200 Europeans would suffice, as the Peguans would join them. He commences, prophetically; "Il est certain que les Anglais chercheront un jour à s'emparer du Pégu." III. p. 60.

formed a brilliant "polychromatic" (to use the slang of the day) coronet to each successive terrace of the temple.

lent and threatening demonstrations on the Chittagong frontier; and it was known that the French were directing their attention to Burma as a good fulcrum for attack or intrigue against British India. For these and other reasons, the Governor General (Sir J. Shore) deputed an embassy to Ava under Captain Michael Symes of His Majesty's 74th Regiment.

It cannot be said that this mission was treated with much respect, or advanced the estimation of the British power among the Burmans. Captain Symes was treated as the envoy of an inferior power, and was undoubtedly himself imposed on by Burmese pretensions. The whole colouring of his narrative tends to leave a very exaggerated impression of the civilisation and magnificence of the Burmese empire.

In 1796, in accordance with the permission conceded in the document given to Captain Symes, Captain Hiram Cox was sent to act as resident at Rangoon on the part of the Government of India. He had charge of some articles which the king had commissioned through Symes. But he was not to proceed to court, unless summoned.

He was summoned, and reached Amarapoora in January 1797. There, or in its neighbourhood, he remained during nine weary months, bearing with singular patience every kind of slight, indignity, and imposition, the history of which it is quite painful to read. In October he returned to Rangoon, and in February he was recalled by the Government, who (misled perhaps by the impression that Symes had given) intimated their opinion that the conduct of the court must have indicated personal dissatisfaction with Captain Cox. And the king and his ministers were addressed, notifying Cox's recall and offering to appoint another gentleman in whom the Vice-president had the greatest confidence, should His Majesty desire it.

Captain Cox's private journal was published in 1821, some years after his death.

Several insolent communications were in the following years received from the Viceroy of Rangoon, and the Governor of Aracan, and in

1802, Captain, now Colonel, Symes was sent again by Lord Wellesley. His mission was attended by an escort of 100 sepoys, and equipped in a style characteristic of the Governor General. He was to seek a treaty of alliance, the cessation of extortionate exactions on trade, the establishment of a resident at court and of a consul at Rangoon, and to claim Negrais or compensating commercial advantages.

The mission was a total failure. The envoy was treated for three months with the most mortifying neglect and deliberate insult, and at last quitted without an audience of leave. It is not to be wondered at, that the Colonel published no narrative of his second mission.

In the basement mouldings, as truly seen in the older buildings, the upper limb is an ogee carved in bold foliation of truly classical character (see Pl. IV. Fig. 17.)

This, in the restorations and beautifications, even of such buildings as the Ananda, has been, by the coarse and tasteless perceptions of the modern architects, degraded into an idiotic and misplaced repetition of the battlemented crown of the cornice.

The basement again always centres in a sort of entablature or

In May 1803, the apprehension of French intrigue in Burma again induced the Government to send Lieut. Canning as agent to Rangoon. But in consequence of the insolent violence of the Ye-woon, who was in charge of the government there, and insisted on opening all letters, Lieut. Canning judged it best to return in November.

In 1804, an outrage was perpetrated on a British ship from Penang, which put into Bassein for wood and water. No notice was taken of this.

1809. Capt. Canning was despatched as agent to Rangoon, with a special view of explaining to the Burmese the nature of our blockade-system, which was then enforced on the French isles, to protect British interests, and to watch the progress of the French in Burma.

He proceeded to Amarapoora at the king's desire. He met with much better treatment than either of the two last missions to the court, and the explanation, which was the main object of his mission, was effected. But he did not leave without receiving from the Woongyees two most impertinent letters to the Governor General.

1811. This year commenced those disturbed relations on the Aracan frontier, which eventually led to the war of 1824. A native of Aracan called King Bering, or Khyen-bran, embodied a number of followers within our territory, and invaded Aracan. In September Capt. Canning was sent to give explanations on this matter, and to complain of the conduct of the Governor of Rangoon towards British trade. Whilst he was still at Rangoon a gross violation of our territory was committed by the Governor of Aracan. Additional instructions were sent to Canning to complain of this and to demand the withdrawal of the Burmese troops from the frontier. In consequence of a repetition of the offence he was recalled, whilst repeated orders came from Amarapoora to send him to court, by force if necessary. He despatched the presents, but returned to Bengal in August.

This was the last Mission up to the breaking out of war in 1824. It is not necessary to follow here the repeated and complicated encroachments and provocations which led to that event. War was declared on the 5th March, 1824, and the peace of Yandabo was signed on the 24th February, 1826.

FRAGMENTS OF ARCHITECTURE
IN THE REMAINS AT PAGAN
From Sketches by T. Chubb and Capt. Bengal Engineers

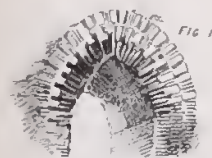


FIG I



FIG II



FIG III



FIG IV



FIG V



FIG VI



FIG VII

WINDOW AT CHAMBERLAIN



FIG VIII

BASE AT CHAMBERLAIN



FIG IX

PIERCEMENT AT CHAMBERLAIN



FIG X

DOOR PIERCEMENT AT CHAMBERLAIN

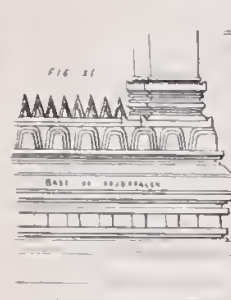


FIG XI

BASE OF CHAMBERLAIN

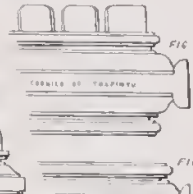


FIG XII

BASE OF CHAMBERLAIN

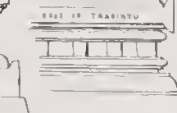


FIG XIII

BASE OF CHAMBERLAIN

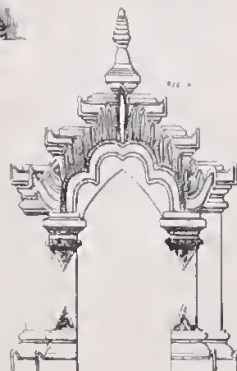


FIG XIV

DOORWAY AT CHAMBERLAIN



FIG XV

STUCCO WORK ON PIERCEMENT AT CHAMBERLAIN



FIG XVI

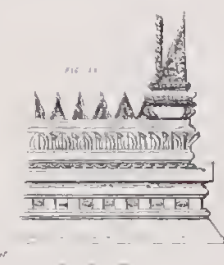


FIG XVII

BASE OF CHAMBERLAIN

Scale 1/2 inch to 1 foot

NOTE: Figures I, XII and XIV only are drawn to Scale

J. A. Yule, Captain, Bengal Eng.

DETAILS OF ARCHITECTURE AT PAGAN
Photographed from a Drawing by CAPTAIN H. YULE.

dado set with alternate recessed pannels and projecting blocks (Pl. IV. Figs. 11, 13.)

The true meaning of these has fortunately been preserved in Ananda as well as in some of the more shattered buildings. In these the pannels are occupied by tiles moulded in relief. In the Ananda the tiles represent a variety of somewhat rude groups of figures and animals with alphabetic characters over them.

In other smaller buildings we have seen them glazed and artistically embossed, representing a variety of ornamental figures, sometimes the Greek honeysuckle (Fig. 6), prancing horses, pelicans, &c. In the Sudha Muní these impannelled tiles were, like those of the battlements, coloured in enamel.

Most of the shafts as well as bases and capitals of pilasters, the cusped arches, flamboyant spires of the door and window canopies, &c., and often too the cornice and basement mouldings, appear to have been originally sculptured (in the stucco) with great richness of effect.* And often this effect, in foliage and other ornamentation, is produced by very slight indications and incisions in the plastered surface. These incisions have been made with such instinctive art, and suggestive skill, that, viewed at a little distance, the most elaborate modelling could scarcely have produced the desired effect more completely.

All this disappears before the ruthless hand of the restorer, and is replaced by a rude plastered surface scratched without taste, art or result. The old work, rough as it is sometimes, is the bold rough sketch of an accomplished artist. The work of the repairer, compared with it, is like a school-boy's chalkings on the wall.

I may now venture to point out a few analogies bearing on the origin of this remarkable architecture.

My attention has not previously been turned to ancient Hindu architecture, and over a great part of this Presidency there are scarcely any remains affording opportunity to become acquainted

* See examples of this stucco-work in Pl. IV. Figs. 14, 15 and 16, for which I am indebted to the kind help of Mr. Oldham. Capt. Tripe's illness on our second short visit to Pagán unfortunately prevented the photographic illustration of these and other details.

with it. But the result of the search that I have been able to make in the Library of the Asiatic Society, since my return from Burma, will perhaps establish the fact that nearly the whole of the *details* are of Indian origin.

I have noticed the resemblance of the spire of these Pagán temples to the common Hindu shiwala. But its absolute identity with a more ancient form of Hindu temple will be seen by a comparison of the spire of the Ananda (Pl. I.) with the ancient Indian "Vimána" as given by Mr. Fergusson.

The most universal and characteristic feature in the Pagán architecture is perhaps the pediment, or canopy, of flamboyant spires over the doors and windows. Compare Figs. 8 and 10 of Pl. V. copied from Ram Raz's Essay on the Architecture of southern India, with the window of Dhamayangyi at Pagán as shewn in Pl. IV. Fig. 4, and it will be impossible, I think, to doubt that this feature was derived from India.

The resemblance is still closer in the doorway of the great temple of Dambúl in Ceylon, as given in Sir J. E. Tennent's book on Christianity in that island. I have not been able to find any good views of the Ceylonese remains, otherwise I doubt not that the closest type of the Burmese architecture would be traced in these.

Compare again the horned and grinning heads which occur so constantly at Pagán in the ornamentation of pilasters, as in Figs. 8, 9 and 14, of Pl. IV. with heads of a similar character over the doorways in Ram Raz's examples just referred to. If there is any doubt as to the identical origin of these it must disappear when we find at Pagán such a head (Pl. IV. Fig. 7.) occupying exactly the same position as in the Indian doorway, and surrounded by the same flame-like spires in both cases. This Gorgon-head, as Raffles calls it, in nearly all the ancient Javanese temples, occupies the same position over the doorways. It is there usually on an exaggerated scale; but it assumes its most monstrous form in the "Tiger-cave" of Cuttack, where a colossal tusked and grinning head envelopes the whole entrance. (See Journ. As. Soc. of Bengal, 1847.) This Gorgon-head, as well as the cusped arch and indications of the flamboyant points, are seen in a plate, by the late Major Kittoe,

of a niche at Badeswur containing an image of Párbatí. (J. A. S. B. vol. VIII. p. 384.)

Take again the monstrous trunked and toothed creatures, disgorging scroll-work, over the pilasters of the Dhamayangyí window just referred to, and set them by the Indian monsters in almost similar position, as shewn in Figs. 1, 3 and 8, in the Plate of Analogies. Who can doubt that the one is derived directly from the other?

Look at the festoon ornament of beads and tassels pendant from the mouths of monstrous grinning heads, as seen in the Gaudapalen (Pl. IV. Fig. 9,) and in the Sembyo-kú. It is one of those details which at first sight were strongly suggestive of European origin. But it is absolutely identical with the adornments of a pillar in a temple on the Madras coast given by Col. Mackenzie in his collections. Similar ornament is seen in the Assam remains described in a late number of the Asiatic Society's Journal, on a pillar at Barolli in Rajpootana given by Fergusson from Todd's Rajasthán; and on a pillar at Jajeepoor in Cuttack, figured by Major Kittoe in the Journ. As. Soc. Ben. Vol. VII. p. 54; as well as in two sculptured pillars found in the sands of the Ganges near Pubna, which now stand at the door of the Asiatic Society's Museum in Calcutta. A modified rendering of the same, Mr. Oldham tells me, he found on some of the fragments at Benares College which are said to have been brought from the ancient Buddhist Pagoda of Sarnath near that city, and very lately on a sculptured stone which he lighted on among the forests of the Nurbudda valley. Remark those curious little peaks or *acroteria* which terminate so many of the flat projecting mouldings in all the Pagán temples: (e. g. see Pl. IV. Figs. 9, 10, 11, 12, 13 and 17.) It is a feature found all over India. It is given by Mr. Fergusson as one of the characteristics in his generalized drawing of a *Mantápa*, or vestibule of an ancient Hindu temple; it appears in Lieut. Maisey's drawings of Kalinjar; it is seen in pillars represented by Col. Mackenzie; and the closest resemblance, not only in this feature but in the manner of its application, will be seen at a glance on comparing the gate of Bhubaneswar in Orissa as given by

Mr. Fergusson, with that very common form of doorway at Pagán, of which an elevation is shewn in Pl. IV. Fig. 10. The same feature is seen in the Assam column figured by Capt. Dalton, and is found on a large scale in the temples of Java (see Raffles, vol. II.)

The remaining figures in the plate of analogies have been brought together for the sake of less defined resemblances of character. Enough, however, has been made out, I think, to shew that all, or nearly all the details of work at Pagán must have had an Indian origin. But this is far from removing the perplexity connected with the origin of these buildings. Grant that all details were borrowed from India. But where shall we find in India any model of the composition? where anything approaching the classical beauty of the Sem-byo-kú, or the stupendous architectural majesty of the Thapinyu and the Ananda?*

The Burman, rejecting indeed, in the pride of his philosophy, the idea of an Eternal Divinity, but recognizing the eternal saucities of nature and conscience, has reared nobler fanes and far more worthy to become the temples of the true God than the Hindu with his deities so numerous and impure.

I have said above, that nearly all the details at Pagán must have had an Indian origin. But this does not apply to *construction*. The arches and vaults, which are such marked features in the Pagán temples, are quite unknown to ancient Hindu architecture. "As far as my own knowledge and researches go," says Mr. Fergusson, "I am certain that I have never been able to detect any trace of an arch in any ancient (Indian) building." (*Ancient Archit. of Hindoostan*, p. 12.)

Having no more to say on the general subject of this architecture, I have still to offer a few notices of remarkable temples not yet described in this Report.

* Perhaps the nearest analogy in general form is to be founded in the rock-cut *Raths* (as they are called) of Mahábálipuram near Sadras.

There is also something, suggestive of the Pagán style in the general arrangement of the great Javanese temples described by Raffles, (including the peculiarity of the cruciform plan,) as well as in some of the details which I have already noticed.

About three quarters of a mile south-east of the ancient city is the great temple of Dhamayangyi.

This temple which dates from the reign of Kalá-Kyá Men ("The king dethroned by foreigners")* about A. D. 1152, in its general arrangement resembles the Ananda more closely than any other, and covers about the same area, though the greater bulk of the vestibules, and greater height of the main walls of the building, must have rendered it, when perfect, even more imposing. Views of some of the architectural details of Dhamayangyi are given in Pl. IV. Figs. 7 and 8. The upper part of the temple is all in sad decay, and the six terraces and crowning spire have well nigh become a shapeless pyramid of brick rubbish. The lower story, however, is in good general preservation; and, as it is nearly stripped of its plaster, it affords a good opportunity of examining the admirable workmanship of these buildings, of which I have already spoken. Where the plaster-work remains, it shews a boldness and richness superior to anything in the more perfect temples. For the usual horn-like wing of the door pediments is here generally substituted a monstrous animal disgorging upcurving scrolls from his gaping jaws (see Pl. IV. Fig. 6.) Here too are seen in perfection those perplexing pilasters with their quasi-Roman mouldings (Figs. 6 and 7); and here, to my delight, I discovered a perfect flat brick-arch over a window.† There were two of these in each wing of the temple, and one of them in particular was as perfect in construction, in joints and radiation, as any London builder could turn

* Col. Forbes (*Eleven years in Ceylon*) quotes the allusion in Crawford's Narrative to this dethroned founder of the temple, as remarkably confirmatory of a passage in Turnour's Epitome of the Singhalese chronology.

This passage states that "the king of Cambodia and *Arramana*" having inflicted many outrages and insults on Singhalese subjects and ambassadors, the king Praa-krama-bahoo, who came to the throne A. D. 1153, sailed with a great armament, landed in *Arramana*, vanquished the enemy, and obtained full satisfaction.

Turnour says that *Arramana* "comprises probably the provinces between Arracan and Siam." It may perhaps be referred to *Mramma*, the true form I believe of *Burma*.

† See this arch in Pl. IV. Fig. 3.

out. No suggestion of European or Indian aid would help here. At least I doubt if in the 12th century the flat brick-arch was known in Europe,* and I know that in the 19th it is one of the most difficult things to get done decently in India. In one of the other buildings, Mr. Oldham told me that he saw not only a flat arch, (not, however, correctly radiated,) but also a segmental discharging arch over it.

The interior of Dhamayangyí contains but one accessible corridor. All the openings leading further inward have been built up, for some unknown reason. I did not succeed in finding the stairs leading to the roof. Major Phayre was more fortunate: his opinion is that this temple never was finished or plastered in the upper part. I think there are good reasons on the other side, but the question is perhaps not worth arguing.

The arch of the western main entrance, and probably the others, have the edges of the intrados entirely composed of roughly dressed stone voussoirs, regularly arranged as headers and stretchers.† In the corner of the building and in the minor arches, stones are introduced occasionally as binders.‡ This has been noticed by Mr. Crawford, as well as the inscribed stones which are found in the northern and western vestibules. In the latter, opposite the entrance, is a remarkable group of sitting figures.§

The Dhamayangyí is encompassed by a high brick-wall of some 250 yards square. This wall is built with as much care and skill, and with almost as elaborate mouldings, as the edifice which it encloses, and consequently it remains very perfect. More beautiful brick-work could scarcely be seen anywhere. The gates in the centre of each side are, however, dilapidated.

Half a mile or more eastward of the Dhamayangyí is another remarkable temple called the *Sudah Muntí*. In construction it

* The only flat *stone*-arches that I recollect to have seen in mediæval buildings are in the side-aisles of Roslin Chapel, in the chimney-piece of the great hall in Glamis castle, and in the magnificent Saracen gateway of Cairo called Bab-el-Fitoor.

† See Pl. IV. Fig. 1.

‡ Do. Fig. 2.

§ Given well in Capt. Tripe's Photograph (No.)

resembles the Thapinyu, but is smaller, and has never been repaired in later times. The brick-work of the upper part is much dilapidated, as much so nearly as that of Dhamayangyi. But that this temple was finished there can be no doubt. The plaster on the walls of a staircase leading to the upper-terraces, at the height of a man's shoulder, was rubbed and polished, as if by the passage of multitudes during ages of occupancy.

Major Phayre did not visit this temple, and I have not learned to what date it is attributed. No one of the remaining structures gives so vivid an idea of what these buildings must have been in the brilliancy of their original condition. The plaster-work of the pilasters and mouldings which remains is of a highly florid and artistic character; the battlemented crown of the parapet is set with large tiles embossed and enamelled in colours; the dado of the basement with smaller tiles in the form of diamonds, rosettes, and other ornamental patterns; and in the flamboyant rays and spires of the pediments even up to the highest remaining terraces the tips were composed of pointed glazed white tiles, which must once have given an extraordinary lustre and sparkling effect to the elevation, a good deal of which is perceptible even in the present decay.

The ground-plan is a single corridor, the vaults and walls of which have been originally covered with tasteful diaper painting in bright colours. This remains visible on the soffit of the arching, but the walls have been white-washed over, and repainted in an inferior style with life-size saints and Buddhas, and with a smaller series of the *Jats* or pre-existences of Gantama.

The plan of the upper story is rather more complicated than usual. There is a principal image chamber, with a well-lighted corridor running all round it, but this inner chamber has not been placed, as in the Thapinyu, centrically under the spire.

An enclosure wall surrounds the temple, equally remarkable with that of Dhamayangyi for the beautiful finish of the brickwork. To the north of this there is a second court, surrounded on three sides by a curious range of vaulted and now dilapidated cells. We could not ascertain the object of these, whether for the residence of the religious order, or for the accommodation of worshippers

from a distance, or merely for the deposit of images of Gautama. No traces at least of the latter remained. At one side there was a small house-like building, apparently once two-storied, which may have been the residence of the Poongyee, or Prior, if this was indeed a conventual establishment, as it most probably was. There was also a small tank surrounded by brick steps. The whole of this court appeared to be of later date than the temple enclosure, and of inferior workmanship.

The *Shwé Kú* or 'Golden Cave,' which an inscription, of which Mr. Crawford has given a translation by Dr. Judson, assigns to about the year 1552, is a very elegant and elaborately white building of no great size, and stands on an elevated terrace, within the city walls and near the Thapinyu. It is of the same general plan and church-like appearance as the Gaudapaleu, but with much concentrated ornament. The projecting vestibule faces the north, which is unusual. In nearly all the other temples, which are not absolutely symmetrical on the four sides, the principal entrance is to the east. The interior is unusually light and spacious in proportion to the area of the building. It is a square vaulted chamber, in the centre of which rises a square mass of masonry supporting the spire, and on the four sides of which are so many Gautamas. It contains several inscriptions; two of them, in very clear and elegant square Burmese characters, being built into the wall, and, as noticed by Crawford, covered with a very hard black varnish so as perfectly to resemble black marble, though a knife forcibly applied to the edge will shew the sandstone beneath.

There are several other minor temples of interest near Thapinyu. A little to the south, and outside the ramparts, stands a group of temples called Sem-byo-kú, to the beautiful details of which I have several times referred. The most conspicuous of the ruins to the westward of Thapinyu is marked by a very curious dome and spire of the Ceylon Dagoba form, but both dome and spire being polygons of twelve sides. This building, from several peculiarities of aspect, is suggestive of great antiquity. The internal vault, which is of considerable height, springs from the ground on every side. In one part of the entrance which, in its length the thick mass of brickwork, exhibits various heights and construc-

tions, a painted timber lintel has been used, now in utter decay. Another part of the entrance vault is a *triangular* arch (see Pl. V. Fig. 5,) about 9 or 10 feet in span, the outer arch which defines the doorway being of the usual pointed form. This temple is called *Putho-Budoh-nya*.

Between this and Thapinyu, an almost shapeless ruin, instead of an arched doorway, has a massive stone lintel, now broken. This is noticed by Crawford as containing Hindu sculptures. The sculptures remain; two inside and several framed in pannels on the exterior. The figures have nearly all four arms, and have a very Hindu character; one of them also in its action strongly resembles the usual Hindu images of the Monkey-god Hanumán, but the head is defaced. Major Phayre visited this temple in company with the Wooudouk, and has furnished a very interesting note on the subject, which is given below.*

* Considering the very proximate derivation of the Buddhism of Burma from the Buddhism of Ceylon, may not the following passage throw some light on the subject. "The Mahabar kings who at an early period had acquired the sovereignty of Ceylon, on the failure of the native dynasty introduced the worship of Vishnu and Shiva into the same temples with that of Buddha. The innovation has been perpetuated, and to the present day the statues of these conflicting divinities are to be found within the same buildings; the Diwalas of Hindooism are erected within the same enclosures as the Wihares of the Buddhists; and the Kappoorales of the one religion officiate at the altars almost beneath the same roof with the priests and neophytes of the other." (*Sir J. Emerson Tennent's Christianity in Ceylon*, p. 222.) The same singular fact is mentioned by Mr. Hardy. (*Eastern Monachism*, p. 201.)

This is a small ruined pagoda, standing close to the Thap-pyi-nyo temple, of the usual form of Buddhist hollow Pagodas. It has a stone-frame to the doorway, which is unusual. This has been broken, from the imperfect construction of the arched brickwork above. On either side of the doorway are four niches in the outer wall of the building. These are all vacant but one, in which is an erect stone-figure about eighteen inches high. It holds a lotus bud in each hand and has a pointed crown or cap on its head. There are other niches, on the side and back walls of the building, containing similar stone figures. These appear to be Indian in character, and one with a monkey-face no doubt represents Hanumán.

Entering the temple, the throne, on which an image had evidently once been placed, occupies as usual the centre of the building. It is now vacant. There

Some distance south of Sembyo-Kú is *Thein-ma-tiet*, of a size considerably larger than the common run of the Pagán temples,

are also two empty places for upright images right and left of the throne; and above these are deep niches for smaller images, one of which is still occupied.

An image of either kind, standing and sitting, has been displaced from the original position, and these now lie on the ground in the temple. They are of stone. One of the standing figures has disappeared altogether.

That which has come from the smaller niche above is a seated figure with the legs crossed, somewhat in the Buddha attitude. The figure has four arms, long pendent ears, and a high cap or crown upon the head. The two left arms hold a conch shell, and a mallet (?); the upper right hand has a *tsek** or discus; the other hand is broken. The figure is supported by a *ga-loon** or bird with a man's head. This is evidently an image of Vishnu.

The standing figure is about four feet high, and was pronounced by the Woondouk who accompanied me, to represent the same person as the sitting figure. This, however, is an error. It also has four arms; in the two right hands are placed a sword and a trident, (supposed by the Burmese to be a lotus bud.) In the left hands are a club and a mallet. The image is much disfigured, but its Indian anklets are visible, and beneath the feet is an animal half broken away, but which probably represents a bull. The image no doubt is that of Siva.

The figure up in the niche was too much concealed by the gloom to be minutely observed. It was apparently riding on a bird.

The Woondouk considered the standing and the seated figures above described as being images of *Pá-rá-mee-thwá*,† a Nát worshipped by Brahmans, and that they, as well as some standing figures of plaster around the central throne, had been introduced as subordinate guardian Náts, in honour of Buddha's image, which once occupied the central place. This image was no doubt of plaster and has decayed by time.

This view of the fact of Hindu deities being introduced into a Buddhist temple is quite consistent with the practice of the present day in Burma. At the Shwé tsee-goon Pagoda in Pagán, which attracts more worshippers than any other, there are in the enclosure figures of Náts to which the people make offerings, in the very presence of Buddha's images, though such is contrary to the tenets of strict Buddhism.‡

That these stone figures were, as supposed by Crawford, the principal objects of worship in the small temple where they are found, I see no reason for con-

* The *chakr* and *Garur* (Sanse.) are both appendages of Vishnu. (Y).

† This term seems a corruption of *Parmeshwar*, applied I believe, to Siva.

‡ See page 226. (Y),

though still to be classed as small among giants such as Thapinyu and Gaudapalen. It is very much on the model of the latter, and is surrounded by a brick enclosure-wall containing remains of other buildings. It is full of paintings of large figures. On the wall, against which the Gautama was placed, were some sixteen personages depicted, which looked excessively like stiff old figures of the apostles on painted glass. In this, or another temple near it, the whole corridor was diapered with minute paintings of Gautama about an inch and a half square.

Not far from this, the outside brickwork having partly fallen from a small solid conical pagoda, it became manifest that it was a real brick-and-mortar *palimpsest*. It had been actually built over another, and that other of highly finished construction, adorned with beautiful moulded tiles, &c.* This building formed a

sidering probable. I rather think with the Woondouk they were simply guardian Náts around the Buddha, to whose memory the temple has been erected. The Woondouk added, however, that these images may have been put into the temple to attract Brahminical worshippers, which, as from indications elsewhere, Indian workmen have apparently been employed on the Pagán temples and sculptures, is not improbable.

* This incrustation of a sacred building appears to be a common Buddhist practice. The great Shwe Madau at Pegu is thus said to have been originally built by two merchants, shortly after the age of Buddha, and to have been only one cubit high, raised by the same individuals to 12. (*Symes's Embassy*, p. 192.)

Speaking of a great Pagoda at Bintenne near Kandy, Mr. Fergusson writes: "The Mahawanso or great Buddhist history of Ceylon, describes the mode by which this building was raised by successive additions, in a manner so illustrative of the principle on which these relic shrines arrived at completion, that it is well worth quoting.

"The Thero Sarabhu, at the demise of the supreme Buddha receiving at his funeral pile the thorax bone relic, brought and deposited it in that identical dagoba [in which a lock of Buddha's hair had been previously placed.] This inspired personage causing a dagoba to be erected twelve cubits high, and enshrining it, thereon departed. The younger brother of King Devenampiatisso (B. C. 250,) discovering this marvellous dagoba constructed another encasing it, thirty cubits in height. King Duttagamini (B. C. 161) while residing there, during his subjugation of the Malabars, constructed a dagoba encasing that one eighty cubits in height. Thus was the Mohayangana dagoba completed. It is possible that at each successive addition some new deposit was made: at least

sort of pair with another pagoda of similar appearance, in front of a small temple of the church character, and the possible object of the incrustation was to make it symmetrize in size with its neighbour.

In passing eastward from the pagoda just mentioned we arrived at the *Shwé San-dau*, a large and lofty pagoda of the Rangoon and Prome type, on a high pyramidal base, and apparently once gilt. Near it, our attention was attracted by a long gabled house, lighted by a few small windows with flat arches in brick of a peculiar construction. Looking in, at a small arched doorway, we found the house to contain a Brobdignagian figure of Gautama recumbent on his side. It was built apparently of brick plastered. But a finger of the hand from which the plaster had been knocked off, was seen to be of sandstone gilt, as if some part at least of the colossus had belonged to a former image of more splendid material.* The eyes were open, and the face, which was the best part of the figure, wore the usual placid smile. The vault of the long chamber in which it lay was painted, rudely enough, with overshadowing palm-trees. The dimensions of the recumbent giant were as follows :

Top of head to fork,	35 feet	5 inches.
Fork to feet,	33	„ 6 „
Nose,	3	„ 3 „
Width of chin,	2	„ 2 „
Length of ear,	6	„ 10 „

most of the Topes examined in Afghanistan and the Punjab show signs of these successive increments, and successive deposits, one above the other.” (*Hand-book of Architecture*, 1. 9.)

The same peculiarity is found in some of the Nubian pyramids, and in the Etrurian tombs. (Id. p. 291.)

* These gigantic figures are probably direct imitations of what ancient Burman pilgrims had seen in Ceylon. At Dambool in that island, says Forbes (I. 370,) a “chamber contains a gigantic and well executed figure of Buddha recumbent, and the statue, as well as the couch and pillow on which he reclines, is cut from the solid rock. This figure is 47 feet in length. The chamber is long, narrow and dark; Gautama Buddha’s position and placid aspect, the stillness of the place, all tend to impress the visitor with the feeling that he is in the chamber of death.”

Breadth of shoulders,	14	„	3	„
Length of arm,	32	„	6	„
Feet (Length,)	10	„	0	„
Toes (ditto.)	2	„	2	„
Hand,	7	„	4	„
Face,	9	„	0	„

On our mentioning this huge image after our return to the steamers, a party started to visit it. They missed their way but lighted on another, of similar character but much greater size! This last, I think, was stated 90 feet long.

On the east side of the Shwé San-dau was a small *cromlech*, of unmistakable character used as a depository table of offerings. It is the only thing of the kind I have heard of in the Burmese countries, and is perhaps an accidental construction, and no relic of primeval customs. The whole of the ground about the base of Shwe San-dau on that side was paved with large masses of sandstone about six feet long and ten inches thick, and this may both have afforded the material and suggested the erection.

So much of Pagán and its remains we saw, but a vast area of ruins remained unvisited by any of the party, and doubtless much of interest has still to be examined. The time which we spent at Pagán altogether was three days and a half in going up, and nearly two days in coming down, but as nearly one whole day was necessarily devoted to public and private letter-writing, and another whole day was abstracted by an attack of fever, I should have come away with much less material for the illustration of these deeply interesting remains, had it not been for the kind assistance of Mr. Oldham, and Lieut. Heathcote.

I may conclude by introducing, not inappropriately, a note with which Major Phayre has favoured me on the Burmese habit of scribbling on the walls of temples, instances of which abound at Pagán.*

* Had I thought of it sooner I might have written an amusing page or two on the Burmese habit of scribbling upon walls. Brick walls white-washed are so uncommon that when one is met with, the people appear to cover every corner of it with figures drawn with charcoal, and written sentences. Their habit in this respect is as inveterate as that of the English. Some of these writings are the mere names of visitors to the temples, others are facetious, a few of the grave

Notes on the Indian species of Lycium.—By T. ANDERSON, Esq.
M. D. Oude Contingent.

In October, 1855, when passing through the Doab between the Ravee and Beas, I gathered a specimen of *Lycium Edgeworthii* of Dunal, a species founded on a plant sent to Dunal by Mr. Edgeworth, from near Sirhind. The plant in my Herbarium is evidently the same as that which Dunal has described, but after most careful and repeated examination of a considerable number of specimens in my possession, I am convinced that Dunal's *L. Edgeworthii* is only a variety of his *L. Mediterraneum*, the *L. Europaeum* of Linnæus. In order that his species *L. Mediterraneum* and *L. Edgeworthii* may be distinguished, he has refined their specific characters so much, that they appear to be the descriptions rather of trivial varieties than of permanent and well-marked species. The differences between the specific characters of the species consist of a line or two in the length of the calyx, a mark of no importance, of minute differences in the length of the pedicels and peduncles and of inconstant characters taken from the existence of minute hairs at the insertion of the filaments in *Lycium Edgeworthii*. In my specimens I found several flowers entirely glabrous. In *Lycium Europaeum* the character is "filamentis basi puberulis." Characters are also taken from the branches and spines, but the latter, in both species, are of all shapes and sizes from a simple thorn $\frac{1}{4}$ of an inch long to a spine 3 inches long, bearing leaves and flowers. Dunal

order. The following are specimens copied from the Baudhi Pagoda at Pagán. "On the 1st day of the waning moon Dengyot 1216, A. D. 1854 Nga Phyoo, Naga Kyen, and Ko Byeen, three persons, who live beneath the golden feet, worshipped the images and Pagodas at Pagán."

Here is another ;

"Palm juice and spirits do not drink ; fowls and pigs do not kill ; avoid these (sins) that you may hereafter meet the Lord A-ri-ma-tee-ya,"* And again ;

"Moung Kha and his wife have worshipped and presented offerings at all the Pagodas—applaud ! applaud !"

* Arimateeya, or Maitri, is the coming Buddha, who will be the fifth and last of the present world-system. "No oath is considered by a Burmese with more awe and solemnity, than to make him declare that in the event of his failing in truth, may he never see the Boodh Arimadeya." As. Res. XX. 178. (Y).

supposes the colour of the corolla of *L. Edgeworthii* to be yellow : in my specimens it is pale rose-coloured as in *L. Europaeum*.

Dunal has purposed to change the name of the Linnæan *L. Europaeum* to *L. Mediterraneum*, a change by no means applicable to a plant widely diffused in India. I therefore retain the Linnæan name and propose the following specific character, which seems applicable to both the Indian and Western plants.

L. Europaeum, fruticosum, cortice albido, ramis spinoscentibus, spinis teretibus, foliis 2—5 ad basin spinarum fasciculatis, obovato-oblongis vel oblongo-cuneatis, pedicellis calyce longioribus, interdum geminis, plerumque unifloris, calyce breviter 5—dentato glabro vel puberulo, corolla calyce duplo longiore anguste infundibuliformi, staminibus inclusis. — *L. Europaeum*, Linn, et auct.; Royle ill. *L. Mediterraneum* Dun. in DC. Prod. xiii. 523 (cum omnibus variet.) *L. Edgeworthii* Dun. in DC. Prod. xiii. 525. *L. indicum* Wight Icones t. 1403.

HAB. in India prope Delhi *Royle*, Guzerat *Wight*, Sirhind *Edgeworth*, Panjab ad Umritsir, *T. Anderson*.

Folia glabra vel punctulata $\frac{1}{2}$ —1 unciam longa. Spinae axillares nudae vel foliosae $\frac{1}{4}$ —1 unciam longae. Flores gemini vel saepius solitarii e fasciculis foliorum. Calyx 5—dentatus cyathiformis 1—2 lineas longus, glaber. Corolla calyce longior infundibuliformis 4—6 lineas longa, roseo-alba. Filamenta filiformia inclusa inaequalia, uno caeteris brevior. Antherae parvae ovatae, basi bifidae. Stylus cylindricus, staminibus longior. Stigma orbiculare, capitatum. Pollen in aqua globosum. Ovarium ovatum. Bacca globosa parva.

In India, special care is required to guard against the undue increase of species, since in this country, besides difficulties arising from want of books of reference, natural causes make the determination of species more difficult than in Europe. One of the most powerful of these is the sudden and complete change of climate in many parts of the Peninsula of India, arising from the periodical recurrence of the rainy season, which often alters the Flora from that of an arid plain to one consisting entirely of a large number of tropical annuals. This climatic change also temporarily affects the appearance or “habit” of the perennial plants, causing a wonderful luxuriance of growth and alteration of the foliage.

To these changes *Lycium Europaeum* is fully exposed. It is a native of dry sandy plains, where before the rains it is stunted in all its parts, but when the air and soil become charged with moisture an expansion of all its parts takes place, fully accounting for the multiform characters of its leaves and the diversity in the length of the spines, etc.

Report on the Progress of the Magnetic Survey and of the Researches connected with it, from November, 1855, to April, 1856.

By ROBERT SCHLAGINTWEIT, *Esq.*

GENERAL OUTLINE OF THE ROUTE.

My brother Adolphe and I left Agra on the 29th of November, 1855, and went through Dholpore and Chanda to Gwalior. We proceeded thence through a part of Bundelkund, by Dutteeah, Jhansi, Tehri, and Dhamoonee to Saugor, which we reached on the 4th of December.

From Saugor we took different routes. Adolphe proceeded by Dhumow to Nagpore and Madras. I left Saugor on the 19th of December, and proceeded by Maharajpore and Bermhan to Narsingpore, on the left side of the Nerbudda valley; from thence I proceeded by Jhansi Ghaut and Meergunge to Jubbulpore, where I arrived on the 30th December.

The route which I followed from Saugor to Jubbulpore afforded me the gratifying opportunity of examining the large deposits of fossil remains of elephants, rhinoceros, hippopotami, &c., which are exposed on the sides of the Nerbudda valley, and I have been able to obtain a tolerably good collection of specimens.

During a stay of six days at Jubbulpore, I was engaged with a series of barometrical and meteorological observations, and with some experiments on the composition of the atmosphere, which were afterwards repeated on the Umerkuntuk Hills.

I started from Jubbulpore on the 6th of January, and went by Mundlah, Ramgurh, Goruckpore and Karenchia up to Umerkuntuk which forms a very important part of the water-shed of Central India. Near it are the sources of the Soane and Tohilla, of the Nerbudda, and of the Yrap, an affluent of the Mahanuddy.

I arrived at Umerkuntuk on the 20th of January, 1856, and having set up my meteorological instruments, which were regularly registered during my stay, I made excursions to the sources of the Tohila and Soane, and up to the summit of Rajmeergurh Hill, which is one of the highest points of the Mekul range, East of Umerkuntuk.

The plateau of Umerkuntuk afforded me a favourable opportunity of making physical and meteorological experiments, and though the absolute elevation is not very considerable (3,290 to 3,339 English feet,) the data obtained for the decrease of the temperature of the air, and of the ground, &c., may not prove without some interest for the physical geography of Central India, when compared with similar data obtained in the Himalayas, the Neilgherries, and Khasia Hills, &c.

I left Umerkuntuk on the 26th January, and proceeded *viâ* Paindra, Moonda, and Amukpore to Sohagpore; thence in a Northerly direction, through Kanrodi and Ramnuggur, crossing the Soane River twice, to Rewah, where I arrived on the 11th of February.

By Mungown and Sohagi, I went to Allahabad, and thence along the Grand Trunk Road to Agra, where I arrived on the 21st of February.

At Agra the whole of the collections sent down last year from the Himalayas, and those made during this cold season, were carefully re-packed for the purpose of being sent to England.

I left Agra on the 8th of March, and travelled *viâ* Delhi to Saharunpore, and thence to Nahun, where I was engaged, for several days, examining the geological structure of the Sewalik range. I obtained many interesting tertiary fossils from various localities in the Sewaliks.

I marched through Dugshaie to Simla, where I arrived on the 25th of March.

The observations made in the outer ranges of the Himalayas, and in various localities in the environs of Simla, will be reserved for the next Report, treating of the Himalayas.

METEOROLOGY.

Besides the daily registry of dry and wet bulb thermometers and barometers, whilst on the march, a longer series of observations was made at Saugor, Bernhan, Jubbulpore and Umerkuntuk; at Sohagpore, Allahabad, Agra and Simla. These observations seem to lead to the following conclusions.

The minimum temperature of the air was very regularly observed to set in just before sun-rise, but there was never to be observed a second depression of temperature immediately after sun-rise, as we had observed in the Indian Seas in October, 1854.

The increase of temperature from sun-rise up to 11 o'clock A. M. is specially rapid between the hours of 8 and 9 A. M. I often noticed an increase of temperature of 4 to 5 degrees centigrade between these two hours.

The total increase from sun-rise to 11 o'clock was, at Saugor, (15th to 19th December,) as much as 28 degrees centigrade; at Jubbulpore it was from 12 to 15 degrees; but at Umerkuntuk (20th to 26th January) the difference between sun-rise and 11 o'clock A. M. was only $8\frac{1}{2}$ to 9 degrees centigrade. Between 11 A. M. and 4 P. M., the variation of temperature was generally not very great—not more than 3 or 4 degrees centigrade; but the decrease of temperature between 4 P. M. and 7 P. M. was very rapid.

East of Jubbulpore, at Ramgurh, and as far as Umerkuntuk, the minimum temperature of the day was very near the freezing point; but I never observed a temperature lower than 32 degrees Fahrenheit, or 0 degrees centigrade.

There was quite regularly a hoar-frost setting in, even if the minimum temperature of the air was 2 or 3 degrees above the freezing point. The hoar-frost was produced by the great radiation of the leaves and grass during the serene nights.

At Umerkuntuk itself I observed some remarkable irregularities of temperature. Considering the cold temperatures experienced in the stations of the Nerbudda valley, Westward of Umerkuntuk, it might be expected to find the minimum temperature of the night at Umerkuntuk below zero; but on the contrary the minimum temperature of the air on the plateau, at the end of January, was constantly 9 degrees and even 12 degrees centigrade above the freezing point.

It was therefore considerably warmer than the minimum of the valleys at the foot of the plateau. Besides the minimum does not take place just before sun-rise, but one or one-and-a-half hour earlier. The reason of this phenomenon is that during the night, the cold air, which is heavier, flows down along the sides of the hills, and accumulates at the bottom of the valleys, whilst at the top of the small plateau itself, the cold air, which is locally formed by the radiation of leaves and grass, is immediately carried away by the winds into the surrounding atmosphere and re-placed by somewhat warmer air.

During the day-time the temperature at the top of Umerkuntuk is of course much lower than in the valleys below. During my stay there the highest observed temperature was 75 degrees Fahrenheit, exceeding by 5 degrees Fahrenheit the maximum temperature of all the other days.

There was only one day quite free of clouds during my stay at Umerkuntuk. Generally, soon after 8 o'clock A. M. quantities of cirri dispersed all over the sky, and mitigated the full power of the sun's rays: they only dissolved themselves partially in the evening before sun-set, some portions remaining even during the night.

Some rain fell on the 29th and 30th of January. It appeared to have extended over a large area, and greatly affected the temperature of the air, cooling it down so that the maximum temperature was lowered more than 5 degrees.

From Jubbulpore up to Umerkuntuk, a strong South-West or South wind set in very regularly between 9 and 10 A. M., and continued till 5 or 5-30 P. M. The nights were constantly calm. At Umerkuntuk the wind blew from the same direction, but it was quite calm during the rain falls. There was not the least wind on the journey from Paindra to Rewah, where again a South-West wind began.

Comparing my meteorological observations with those made during the cold season of 1854-55 by my brothers and myself, in the Southern parts of India, the Deccan, Mysore, &c., I find that in Southern India there is, at equal elevations, never so cold a temperature as I observed this season in Central India, in the valley of the Nerbudda, &c.

In connexion with this fact it deserves mention, that in summer the reverse takes place, and that the maximum heat of Central India, at equal elevations, generally exceeds somewhat that of Southern India.

Together with the observations of the dry and wet bulb thermometers, the readings of the barometer were registered, and I have been able to determine the heights of all important places on the route followed. Some stations were determined both by the barometer and the boiling point thermometer, which from its minute and accurate divisions (each degree of Celsius is divided into 100 parts) and having been carefully compared at different heights with barometers, may be considered as giving equally accurate results with the barometer itself. On the journey from Sohagpore to Rewah, I used only this instrument, as the barometer was leaking very much, and some air had introduced itself into it.

The minimum of barometric pressure at about 4 P. M. occurred on the small plateau of Umerkuntuk, very nearly at the same time as in the lower valleys and plains of Hindustan, and the daily variation of the barometer seems to be very nearly the same at Umerkuntuk as it is in the plains.

The temperature of the earth at different depths was determined by the long thermometer (one metre in length.) For greater depths I used a thermometer, the bulb of which was made extremely insensible. The observations of the temperature of the ground at Umerkuntuk, compared with similar data around the base of the hill, afford some curious examples of the cooling influences which extensive jungles have, upon the temperature of the ground. At Umerkuntuk the temperature was, 22nd to 25th January—

At one metre below the surface,.....21° 2' Centigrade.

„ two metres, „21° 5' „

At Paindra, more than 1,000 feet lower than Umerkuntuk, the temperature was, 27th to 29th of January—

At one metre below the surface,.....20° 0' Centigrade.

„ two metres, „21° 0' „

I observed similar differences at Ramgurh, and at some other stations West and North of Umerkuntuk, which are all 1,000 to 1,300 feet lower than the plateau.

This anomalous phenomenon seems to be due to the following causes.

The plateau of Umerkuntuk itself has comparatively little jungle, and the ground is exposed freely to the action of the sun. Round the base of Umerkuntuk, and especially on the slopes of the hills, very thick and extensive jungles prevail, which keep the ground moist and cool, as they prevent the heating of the surface by the powerful tropical sun.

The meteorological observations which I had occasion to make in many parts of the jungles of Central India, as well as those of my brother Hermann in Assam, and of my brother Adolphe in the Godavery jungles, offer many striking examples of the cooling influence which extensive jungles exercise in India on the temperature of the ground, as well as on the atmosphere.

The anomalous cooling of the ground by jungles is still more apparent than the difference of temperature in the air of jungles when compared with open districts, since the differences in the temperature of the air are much more equalized by winds and atmospheric currents.

At Agra I was enabled, through the kind assistance of Colonel J. T. Boileau, the Chief Engineer, to ascertain the temperature of the earth nearly 50 feet below the surface. The insensible thermometer was sunk in a small shaft dug for the purpose, and remained buried there for a fortnight before it was taken up. The temperature was, from the 22nd of February to the 4th of March, $28^{\circ} 3'$ centigrade, equal to $82^{\circ} 9'$ Fahrenheit. The temperature thus observed accords, within one degree, with the temperature of the earth at about 60 feet below the surface, ascertained at Beuares in April 1855. The temperature at one metre below the surface at Agra was only 25 degrees centigrade, as the upper strata had been cooled by the influence of the past cold season.

The temperature of the wells at Agra was always a little lower than that of the ground, thus directly ascertained. As an average of several wells from which a large quantity of water was constantly drawn for domestic purposes and irrigation, I obtained $27^{\circ} 6'$ to $27^{\circ} 8'$ centigrade.

The temperature of water in wells, which are but little used, is considerably cooler than that of wells from which water is constantly drawn, as the cold air which sinks down during the night into the wells cools stagnant water much more than it can do the water of wells which is constantly removed.

As a curious phenomenon connected with Physical Geography, I finally beg to mention the way in which the jungles are distributed in Central India.

The base and slope of the hills, and the valleys between them, are generally covered with very dense and extensive jungles, but the summit of the flat hills and small plateaux which occur in many localities, are nearly always quite bare and destitute of trees and jungly vegetation. I had been informed by my brothers, that this very curious phenomenon occurs all along the Southern parts of the Khasia and Jynteah Hills, and on the plateau of the Neilgherries.

This phenomenon seems to be due, in part, to the very strong winds which sweep over those isolated plateaux and which evidently must be very injurious to jungle vegetation. Another important cause is, the want of moisture in these isolated plateaux.

The geological results obtained in the journey from Agra to Saugor will be contained in the Report which my brother Adolphe will have the honour to submit to Government; I shall therefore content myself by mentioning some geological results to which the investigation of the country visited by me alone seems to lead.

In the valley of the Nerbudda some interesting deposits of fossil remains occur. The larger deposits are found from Bermhan up to Mundlah, the bones are found in a brown alluvial clay, and belong to species of elephants, rhinoceros, hippopotami, buffaloes, &c. I also found with the bones well preserved fossil shells of *Unio*, *Melania*, and other fresh-water species. A comparison of these fossil shells with those now living in the Nerbudda, and in various tanks of Central India, of which I collected a large number, will assist in determining the geological age of the fossiliferous deposits of the Nerbudda valley.

From Jubbulpore to Umerkuntuk the prevailing rock is black trap, identical with the trap of the Deccan.

I found in several localities the thin lacustrine deposit, which reposes on trap, and is again overlaid by other layers of trap.

In some places it was full of fossil fresh-water shells of *Physa*, *Unio*, *Melania*, &c.

The principal fossiliferous localities which I visited were Phool Saugor, about 9 miles west of Mundlah, Bellasur, and Bonder.

The plateau of Umerkuntuk is one of the culminating points of Central India and this place, and the hills in its neighbourhood, form the important water-shed of Central India, between the Rivers Nerbudda, Soane, Tohilla, and Mahanuddy. The plateau of Umerkuntuk is not very large—it is nearly circular, and surrounded by hills, which are only 50 to 60 English feet higher. The slopes are very steep to the East and South, whilst they are much more gentle to the West and North. The hills run from Umerkuntuk first in a Northerly direction, and then turn to the North-West. They are generally known by the inhabitants under the name of Mokul. The highest point of this range is probably Rajmeergurh, near Umerkuntuk, which it exceeds by about 500 English feet—the latter place itself is about 3,290 to 3,330 English feet.

The Nerbudda alone rises on the plateau of Umerkuntuk. It has its origin in a tank or pool, surrounded in the most irregular way, with solid masonry and fine temples:—one of the oldest of them seems to me to be a Jain (Buddhist) temple. The tank is fed by subterranean springs, and the origin of the Nerbudda is thus precisely similar to that of the Kistna, on the plateau of Mahabaleshwur in the Deccan.

I determined the quantity of water at the spot where the Nerbudda flows out of the tank, and found it to be, on the 23rd of January, only two French litres per second. But very soon this little rivulet is met by the waters of two other springs, and only a few miles from its source it is joined by the waters of two more springs, and forms a beautiful cataract of about 70 English feet.

The Soane has not its rise at Umerkuntuk, but to the East of the hill, and about 1,200 feet lower than the Nerbudda in an open partially cultivated spot, from a tank called Sone Budder, 8 miles

East of Paindra, and forms a swampy marshy place over a considerable extent.

The Tohilla rises about 5 miles North of the Nerbudda, at a place called Tohaletsur, nearly on a level with the Nerbudda.

The Yrap, a small river, which flows to the South, and joins the Mahanuddy, has its origin near Paindra, from several large tanks, forming at first a swampy ground. Its source is situated about 5 or 6 miles from that of the Soane, and its water-shed is not formed by a distinct ridge, but only by a slight rising of the ground.

On the journey from Sohagpore through Rewah to Allahabad, I took the opportunity of carrying a barometric and geological section over the plateau of Bundelkund.

The plateau, or rather the succession of plateaux, consists of a reddish and white sandstone, in large banks, which are generally horizontal—it reposes upon limestone and shales of blue and grey colours, which very often are a little more inclined than the sandstone, and the shales are quite identical with similar rocks which I observed in the Gwalior Territory. The plateau of Bundelkund terminates abruptly about 40 miles South of Allahabad, where the sandy deposits of the plain of Hindustan begin.

Simlah, 27th May, 1856.

*Mean temperature and fall of rain in Darjiling, Sikhim Himalayah,
1848 to 1855.—By J. R. WITHECOMBE, M. D. Civil Surgeon.*

Months.	Julla Pahar 7500 feet above the sea.			Civil Station Hospital 6902 feet above the sea.			Observatory 7168 feet above the sea.		
	Mean Temperature.								
	1848-49.	1849-50.	Average.	1850-51.	1851-52.	1852-53.	1853-54.	Average.	1854-55.
May,	58.53	60.49	59.51	59.14	61.60	59.40	61.35	60.37	59.90
June,	61.42	62.12	61.77	63.59	62.57	62.15	64.34	63.16	61.66
July,	63.23	62.87	63.05	63.69	63.80	63.07	65.26	63.96	62.70
August,	63.28	61.81	62.54	63.26	64.41	63.80	64.13	63.90	62.59
September,	60.13	62.78	61.45	62.32	63.23	62.09	62.02	62.42	60.89
October,	55.81	55.93	55.87	61.85	58.89	56.40	56.71	58.46	57.86
November,	48.49	48.38	48.43	54.48	50.41	48.05	49.28	50.56	51.09
December,	43.08	41.96	42.52	55.89	44.86	42.75	45.29	44.70	47.30
January,	40.04	42.24	41.14	40.96	42.25	36.79	45.85	41.46	39.42
February,	40.77	41.93	41.33	41.79	47.17	47.23	42.01	45.55	41.93
March,.....	50.13	48.38	49.26	51.91	47.23	52.83	51.47	50.86	49.36
April,	59.53	56.77	58.65	55.71	54.43	57.74	53.83	55.43	52.58
Average,	53.79	53.80	53.79	55.38	55.57	54.36	55.13	54.99	53.94

RAIN IN INCHES.

	1850-51.	1851-52.	1852-53.	1853-54.	1854-55.	Average for 5 years.
May, ...	2.74	6.75	9.15	2.07	5.68	5.28
June, ...	30.55	31.00	17.30	26.90	40.57	29.26
July, ...	32.02	27.15	35.40	29.49	18.55	28.52
August, ...	40.02	16.70	15.35	31.26	40.91	28.85
September, ...	20.00	19.60	15.15	20.15	28.10	20.60
October, ...	.00	9.35	.45	4.34	4.15	3.64
November, ...	.00	1.50	.05	.37	2.10	.80
December, ...	.00	.05	.80	.00	.20	.21
January, ...	2.05	3.45	.00	1.85	.10	1.49
February, ...	2.75	2.40	.75	.75	1.57	1.64
March, ...	4.40	4.00	17.40	.00	.40	5.24
April, ...	.55	4.55	2.70	1.00	5.10	2.78
Total fall of rain,...	135.08	126.50	114.50	118.18	147.43	

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR JANUARY, 1857.

At the annual general meeting of the Society, held on the 7th January, 1857,

Hon'ble Sir James Colvile, Kt. President, in the Chair.

The Secretary read the following

REPORT.

The Council of the Asiatic Society have the satisfaction of submitting their annual report exhibiting the Society's transactions, and the state of its affairs during the past year.

The number of ordinary members resident in India at the close

	Ordinary.	Paying.	Absent.	of every year since 1851 has re-
1851..	130	124	6	mained nearly stationary, rang-
1852..	139	122	17	ing between 122 in 1852, and
1853 .	146	123	23	131 in the present year. During
1854 .	155	129	26	the last twelve months there has
1855 .	162	128	34	
1856..	167	131	36	

been an accession of 19 new members. The loss has been altogether 14, of which 7 have been removed by death, 6 by retirement, and one (Dwarika Nath Basu) under bye law 13 of the Society's rules.

It will thus be seen that during the past year, there has been an addition of only 5 to the number of members. The entire list contains 167 names, inclusive of those absent in Europe.

The obituary includes the names of Major General Sir W. H. Sleeman, K.C.B., Dr. Montgomerie, Lieut. Chancey, Rájá Sattya-charan Ghosal, Raja Sriesh Chandra Ráya, and Messrs. Houstoun and R. W. G. Frith.

Dr. Montgomerie was a zealous and disinterested promoter of the objects of the Society, and as the discoverer of Gutta Percha had received the gold medal of the Society of Arts of London.

Mr. Frith was distinguished for his devotion to the science of Entomology.

By the death of the Rev. Dr. Buckland, the Society has lost one of its most distinguished honorary members.

The names of Professor Langlois and Mons. Marcel have also to be removed from the list, and the Society has to deplore the loss which the cause of Oriental literature must suffer from the demise of these two distinguished savans, the intelligence of whose death only reached India a few months ago.

Seven corresponding members have been elected during the last twelve months, some of whom are Oriental scholars, or are otherwise distinguished for their literary or scientific attainments.

Finance.—The abstract statement No. 1 annexed to the report shews the receipts of 1856 to have been Rs. 18,204-7-1, which added to the balance of the preceding year (Rs. 6,251-13-8) make the total of Rs. 24,456-4-9.

The disbursements amount to Rs. 17,321-6-5, inclusive of the sum of Rs. 2,500 advanced to the Oriental Publication Fund as a temporary loan, and which must be considered a part of the balance. The total liabilities amount to Rs. 3,605-9-4, while the cash balance in hand is Rs. 6,664-14-1, to which is to be added the sum of Rs. 2,500, advanced to the Oriental Fund, making a total of Rs. 9,164-14-1. In addition to this, there are outstanding assets to the extent of Rs. 8,908-3-8.

Of the outstanding sums due to the Society, shown in the report of 1855, Rs. 485-4 have been written off to Profit and Loss as unrealizable subscriptions due from deceased members, and although there are still several items of a similar nature, yet the Council are not without hopes that opportunities may occur for recovering a considerable portion of them.

INCOME.				The marginal estimate of the probable income and expenditure of the next year will be found to fall short of that of previous years, simply because the amount of the Government Grant for the Museum of Economic Geology has ceased to be borne in the accounts, in consequence of the removal of that establishment, and the cessation of the allowance from September last.
Contributions,	..	8,000	0	The subject of reducing the rate of subscription to the Society from Rs. 16 to 10 per quarter was brought forward for final discussion and decision in September last.
Government Grant at 300	..	3,600	0	
Sale of Books,	..	1,000	0	
Journal,	..	800	0	
Interest,	..	120	0	
Miscellaneous,	..	10	0	
		13,530	0	The proposition was originally moved by Major Thuillier in Nov. 1855. The Council after careful deliberation reported against the expediency of the proposed change, and the question having been referred to the Society at large, and the votes of absent members solicited under bye-law 45, the motion was negatived at a special meeting, held in September last, the number of suffrages obtained in favour of the motion being 25, whilst 23 were given against it.
Monthly average	..	1,127	8	
Expenditure.				The subject of reducing the rate of subscription to the Society from Rs. 16 to 10 per quarter was brought forward for final discussion and decision in September last.
Zoological Museum,	..	4,200	0	The proposition was originally moved by Major Thuillier in Nov. 1855. The Council after careful deliberation reported against the expediency of the proposed change, and the question having been referred to the Society at large, and the votes of absent members solicited under bye-law 45, the motion was negatived at a special meeting, held in September last, the number of suffrages obtained in favour of the motion being 25, whilst 23 were given against it.
Library—Etabt.	936	0	0	
Bookbinding,	300	0	0	
Purchase of books,	..	650	0	
Contingencies,	114	0	0	
		2,000	0	
Etabt. General,	..	1,800	0	The proposition was originally moved by Major Thuillier in Nov. 1855. The Council after careful deliberation reported against the expediency of the proposed change, and the question having been referred to the Society at large, and the votes of absent members solicited under bye-law 45, the motion was negatived at a special meeting, held in September last, the number of suffrages obtained in favour of the motion being 25, whilst 23 were given against it.
Journal,	..	2,700	0	
Miscellaneous, including Building,	..	1,200	0	The proposition was originally moved by Major Thuillier in Nov. 1855. The Council after careful deliberation reported against the expediency of the proposed change, and the question having been referred to the Society at large, and the votes of absent members solicited under bye-law 45, the motion was negatived at a special meeting, held in September last, the number of suffrages obtained in favour of the motion being 25, whilst 23 were given against it.
Deposit,	..	72	0	
		11,972	0	The proposition was originally moved by Major Thuillier in Nov. 1855. The Council after careful deliberation reported against the expediency of the proposed change, and the question having been referred to the Society at large, and the votes of absent members solicited under bye-law 45, the motion was negatived at a special meeting, held in September last, the number of suffrages obtained in favour of the motion being 25, whilst 23 were given against it.
Monthly average,	..	997	10	
		8		

red to the Society at large, and the votes of absent members solicited under bye-law 45, the motion was negatived at a special meeting, held in September last, the number of suffrages obtained in favour of the motion being 25, whilst 23 were given against it.

Library. Considerable improvement has been effected in the preservation and arrangement of the books. Much, however, yet remains to be done in the way of enriching the contents of the Library. Nearly 250 vols. have been added during the year, a considerable portion of which are donations from authors and learned societies. The leading Scientific periodicals of Europe, obtained either by purchase or exchange, are from time to time laid on the table of the new reading-room for perusal.

A new catalogue of the Library has been published, copies of which may be had by members free of charge by application to the Librarian. The price to non-subscribers has been fixed at 3 Rupees a copy.

The Coin Cabinet of the Society has received an addition of 17 gold coins from the Government of the N. W. Provinces, and a few silver coins of historic importance have been contributed by several gentlemen.

The Government of India having resolved upon establishing a separate Geological Museum in connection with the Geological Survey, has directed the transfer to the proposed institution of its Museum of Economic Geology which has been in charge of the Society since 1841.

By this arrangement the Society has lost the valuable services of Mr. Piddington, who, besides taking charge of the Government Museum of Economic Geology, has hitherto had the care of the Society's own collections of minerals and rocks.

The accession of new specimens in this department has been recorded by the Curators. They include amongst others a superb meteorite from Sougonle presented by Mr. Grote; a valuable collection of fossils from Kohat by Lieut. Trotter; a fine specimen of the scarce mineral Condroidite from Nagpore, by the Rev. S. Hislop; a box of minerals and specimens illustrating the different stages of metallurgical processes, particularly of the manufacture of iron from Col. Tremenhere; and a valuable series of Casts of Sewalik fossils from the Museum of the India House, presented by the Hon'ble Court of Directors.

The Museum continues to be a source of considerable attraction					to the public, and that it is duly															
Nov. 18th to 29th being 12 days open					appreciated is best shewn by the															
<table border="0"> <tr> <th colspan="2">Natives,</th> <th colspan="2">Europeans.</th> <th></th> </tr> <tr> <th>Male</th> <th>Female</th> <th>Male</th> <th>Female</th> <th>Total.</th> </tr> <tr> <td>2889</td> <td>81</td> <td>65</td> <td>19</td> <td>3054</td> </tr> </table>					Natives,		Europeans.			Male	Female	Male	Female	Total.	2889	81	65	19	3054	numbers who daily resort to the
Natives,		Europeans.																		
Male	Female	Male	Female	Total.																
2889	81	65	19	3054																
December 26 days open.					rooms. Very few persons having															
<table border="0"> <tr> <td>5638</td> <td>205</td> <td>288</td> <td>118</td> <td>6249</td> </tr> <tr> <td colspan="4"></td> <td><hr/></td> </tr> <tr> <td colspan="4"></td> <td>9303</td> </tr> </table>					5638	205	288	118	6249					<hr/>					9303	hitherto recorded their names in
5638	205	288	118	6249																
				<hr/>																
				9303																
					the visitors' book, the Jemadar was															

directed in the middle of November last to note carefully the name and sex of every visitor who expressed either an inability or a reluctance to write. The average thus obtained appears to have exceeded 240 persons a day, as shewn in the margin.

Journal.—Six Nos. of the Journal have already been issued, and another, which will be the last of the year, is in the press, and nearly ready for publication. Of these No. VII contains a complete

and efficient Index to the last two volumes of the *Researches*, and the first 23 vols. of the *Journal*.

It is hoped that this publication will supply a desideratum which has been long felt by all who have occasion to consult the pages of the Society's transactions, and render the varied and valuable matter contained in the volumes accessible, not merely to our own members, but to the public at large.

Officers. Babu Gour Doss Bysâck was appointed in March last Assistant Secretary and Librarian in place of Bábu Rájendralál Mittra resigned, whose valuable services have received the public acknowledgment of the Society, as recorded in the proceedings of February last. His successor has been very regular and assiduous in the discharge of his duties.

Oriental Fund. It has been found that from the rapid issue of the Nos. of the *Bibliotheca Indica* during the last three years, the demands upon the Oriental Fund have far exceeded its resources. The activity of the several editors had pushed the publication of the series beyond the limits warranted by the Government allowance, and the consequence has been, the accumulation of heavy liabilities which have been the subject of remark both by the local and home Government.

It has therefore been resolved that the publication should be suspended until provision is made for the liquidation of the debts.

The principles on which the *Bibliotheca Indica* has lately been conducted were likewise made the subject of animadversion by Professor Horace Hayman Wilson, and the Hon'ble Court of Directors. They drew the attention of the Society to the disproportion of the Arabic to the Sanscrit publications, which they considered inconsistent with the comparative claims of the two departments of literature, and dwelt on the importance of confining the appropriation of the grant to the encouragement of the Sanscrit language, except in the case of works illustrative of the history or social condition of India.

The Society without concurring in the wisdom of restricting the *Bibliotheca Indica* to Sanscrit works, or to works relating exclusively to India, have expressed every disposition to be guided by the views advanced by the learned Professor and the Hon'ble Court.

The Council are glad to add that the liabilities of the Oriental Fund have been considerably reduced within the last year.

During the last twelve months only 8 Nos. of the Bibliotheca Indica have been issued, of which 5 are Sanscrit and 3 Arabic.

The names of the works are:—

1.—The Taittíriya Sañhitá of the Black Yajur Veda, edited by Dr. E. Röer, Nos. 133, 134 and 137.

2.—The Brihad Aranyaka Upanishad, edited by Dr. Röer, No. 135.

3.—A Biographical Dictionary of Persons who knew Mahommed, edited by Moulavies Mahamed Wayzeh Abdul Haqq and Golam Kadir, and Dr. Sprenger, Nos. 136 and 138.

4.—Waquidy's History of Mahamed's Campaign, edited by A. Von Kremer, No. 139.

5.—The Márkandeya Purána, edited by the Rev. K. M. Banerjea, No. 140.

It will be observed that these numbers are in continuation of works already undertaken. No new work has been commenced nor will be, until the unfinished editions are completed, which will be a work of time in consequence of the extent to which the resources of the Fund have been anticipated.

With the conclusion of the works in hand, the present series of the Bibliotheca Indica will be brought to a close, and it is the opinion of the Council that a new series should not be commenced without a careful revision of the rules under which the publication has been conducted.

The report was adopted.

The meeting then proceeded to ballot for the Council and Officers for the ensuing year. Captain Sherwill and Mr. Gordon Young, were appointed Scrutineers, and at the close of the ballot, the Chairman announced the following result:—

HON'BLE SIR J. W. COLVILLE, KT. *President.*

BÁBU RAMGOPAL GHOSE,	} <i>Vice-Presidents.</i>
DR. G. G. SPILSBURY,	
A. GROTE, ESQ.	

DR. H. WALKER.

C. BEADON, ESQ.

DR. T. THOMSON.

DR. T. BOYCOTT.

CAPT. C. B. YOUNG.

BÁBU RAMÁPRASAD ROY.

E. A. SAMUELLS, ESQ.

T. OLDHAM, ESQ.

MAJOR STRACHEY.

W. S. ATKINSON, ESQ.

BÁBU RÁJENDRALÁL MITTRA. } *Joint Secretaries.*

The question of transferring the Society's Geological collections to the new Government Museum, as proposed in the letter (dated 11th July last) from the Government of India, laid before the Society at the August Meeting, was taken into consideration. The Secretary announced that 8 non-resident members out of 55 had replied to the Circular which was addressed to them, requesting their votes on the subject of the transfer, two voted in favour of, and 6 against the transfer. Such of the letters as contained remarks were then read, and several members having addressed the meeting the question was put to the vote, and negatived by a majority of one.

	For.	Against.
Non residents,	2	6
Residents,	12	9
	—	—
	14	15
	—	—

The meeting then separated.

STATEMENT

Abstract of the Cash Account of the Asiatic

RECEIPTS.				
	1855.			1856.
CONTRIBUTIONS,	7,166	0	0	
Received from Members, ...	..	..	..	8,096 0 0
ADMISSION FEE,	512	0	0	
Received from new Members,	..	..	..	448 0 0
JOURNAL,	784	8	0	
Sale Proceeds of, and Subscription to the Journal of the Asiatic Society,	..	..	..	768 10 0
LIBRARY,	631	14	0	
Sale Proceeds of Books, ..	...	..	1,623 13 9	
„ „ of Bookshelves,	0	0	0 38 4 0	
				1,662 1 9
MUSEUM OF ZOOLOGY,	3,662	10	6	
Received from the General Treasury at 300 Rs. per month, ..	..	..	..	3,600 0 0
MUSEUM OF ECO. GEOLOGY,	3,768	0	0	
Received from the General Treasury at 314 Rs. per month up to September, 1856, ..	..	..	..	2,826 0 0
SECRETARY'S OFFICE,	..	1	13 3	
Discount on Postage Stamps,	..	..	2 2 3	
Fine, ..	..	..	1 0 0	
Refund of Postage, ..	..	..	2 1 0	
				5 3 3
				Carried over, 17,405 15 0

No. 1.

Society for 1856.

DISBURSEMENTS.

	1855.	1856.	
JOURNAL, ...	2,631 14 0		
Freight, ...		72 10 0	
Printing Charges, ...		2,483 12 9	
Engraving, ...		28 0 0	
Colouring, ...		45 0 0	
Lithographing, ...		168 4 0	
Purchase of Journal, ...		10 8 0	
Commission on sale of Books, ...		10 14 5	
Petty Charges, ...		35 2 6	
Correcting and Checking Index for Journal, ...		58 9 0	
			2,912 12 8
LIBRARY, ...	2,335 9 1		
Salary of the Librarian, 12 mths. at 70 pr. mth. ...		840 0 0	
Establishment, ditto, at 8 per month, ...		96 0 0	
Purchase of Books, ...		179 15 3	
Freight, ...		62 4 0	
Book-binding, ...		381 10 0	
Commission on sale of Books, ...		118 6 8	
New Book cases, ...		460 0 0	
Petty Charges, ...		33 1 0	
Stationery, ...		19 7 0	
Postage, ...		4 8 0	
Bill of Lading, ...		0 2 0	
Labelling Shelves, ...		5 10 0	
Copying Charges, ...		1 0 0	
Repairing Plaster Figures, ...		15 0 0	
			2,216 15 11
MUSEUM OF ZOOLOGY. ...	6,003 4 0		
Salary of the Curator E. Blyth, Esq. at 250 pr. m. 12 ms. ...		3,000 0 0	
House-rent, at 40 per month, 12 do. ...		480 0 0	
Establishment, at 35 per month, 12 do. ...		420 0 0	
Contingent Charges, ...		196 2 0	
Landing Charges, ...		8 1 6	
Postage, ...		9 9 6	
Stoppered Bottles, ...		20 0 0	
			4,133 13 0
MUSEUM OF ECONOMIC GEOLOGY, ...	3,711 5 6		
Salary of the Curator H. Piddington, Esq. up to September, at 250 per month, ...		2,250 0 0	
Establishment, ...		315 0 0	
Contingent Charges, ...		214 12 6	
			2,779 12 6
SECRETARY'S OFFICE, ...	1,963 5 9		
General Establishment ...		770 13 0	
Secretary's Office Establishment, at 54, ...		648 0 0	
Freight, ...		4 0 0	
Lithographing bills, circular, &c. ...		21 1 3	
Carried over, ...	1,443 14 3	12,043 6 1	

Brought forward, Co.'s Rs. 17,405 15 0
29 3 7

VESTED FUND.

Interest on Company's Paper from the Govern- ment Agent,	29 14 9		
Interest on 2,500 Rs. advanced to the O. P. Fund from 16th Jan. to 31st Dec. 1856, at 4 per cent.	95 13 4	125 12 1	

GENERAL ESTABLISHMENT.

	0 8 0		
Fine,		2 2 0	

DEPOSIT ACCOUNT.

On Account Spilsbury Testimonial,	17 0 0		
F. E. Hall, Esq.	41 0 0		
H. P. Riddell, Esq.	2 0 0		
Major J. C. Hannyngton,	32 0 0		
C. Gubbins, Esq.	32 0 0		
W. T. Blanford, Esq.	10 0 0		
R. Spankie, Esq.	16 0 0		
Rev. S. Hislop,	16 11 0		
Rájá Apúrva Krishna Deb,	50 0 0		
		216 11 0	

STACY COIN COLLECTION.

Received from Major General Hon'ble J. Low his subscription to the Fund,	50 0 0		
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WILLIAMS AND NORGATE.

Received from Raja Apúrva Krishna by transfer from Deposit Account,	100 0 0		
from Raja Radhacaunt Deb,	2 0 0		
„ from Rájendralál Mittra,	300 0 0		
		402 0 0	

LIEUT. R. STEWART.

Refund of Postage,	0 12 0		
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W. MUIR, ESQ.

Refund of Postage,	0 9 0		
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REV. S. HISLOP.

Refund of Postage,	0 10 0		
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Carried over, 18,204 7 1

	Brought forward, Co.'s Rs.	1,443	14	3	12,043	6	1
Printing Charges,	20	0	7			
Stationery,	82	7	0			
Petty Charges,	38	4	9			
Postage,	120	1	3			
Copying Charges,	5	0	0			
Tin boxes for Cash, and Secretary,	11	4	0			
						1,720	15 10

DEPOSIT ACCOUNT, ...	...	673	4	0			
Rev. S. Hislop on account, ...	...	5	0	0			
Babu Dwarka Nath Chatterjee, ...	...	66	8	0			
F. E. Hall, Esq. on account Contribution and Postage, ...	...	32	1	0			
C. Gubbins, Esq. ...	...	48	0	0			
Major M. L. Loftie, ...	...	16	0	0			
Hon'ble Capt. Byng, ...	...	48	0	0			
Major Hannington, ...	...	64	0	0			
Raja Apúrva Krishna Deb by transfer to Messrs. Williams and Norgate, ...	...	100	0	0			
R. Spankie, Esq. ...	...	16	0	0			
						395	9 0

MISCELLANEOUS, ...	...	236	11	3			
Petty Charges on account of Meetings, ...	...	181	14	0			
Advertising Meetings, ...	...	31	0	0			
Repairing a Clock, ...	...	10	0	0			
Varnish to different pictures, ...	...	10	2	0			
						233	0 0

WILLIAMS AND NORGATE, ...	...	11	0	0			
Purchase of Books on their account, ...	...	17	4	0			
Freight, ...	...	5	0	0			
						22	4 0

BUILDING, ...	...	272	14	0			
Assessment, ...	...	328	2	0			
Sundry Repairs, ...	...	16	10	0			
Laying Khoas on the Compound, ...	...	59	10	6			
						404	6 6

ORIENTAL PUBLICATION FUND.							
Paid a Loan, ...	...				2,500	0	0
LIEUT. R. STEWART.							
Postage Stamps paid on his account, ...	...				0	12	0
W. MUIR, ESQ.							
Postage Stamps paid on his account, ...	...				0	9	0
J. NICOLSON, ESQ.							
Postage Stamps paid on his account, ...	...				0	8	0

Carried over, 17,321 6 5

BALANCE OF 1855.		Brought forward, Co.'s Rs. 18,204 7 1			
Bank of Bengal,	5,820	13	7
Cash in hand,	62	10	7
			<hr/>		
			5,883	8	2
Inefficient Balance,	368	5	6
			<hr/>		
				6,251	13 8
				<hr/>	
				24,456	4 9
				<hr/>	

The 31st Dec., 1856.

GOUR DOSS BYSÁCK.

Asst. Sec.

BALANCE.		Brought forward, Co.'s Rs. 17,321 6 5									
Bank of Bengal,	...	...	6,574	14	10						
Cash in hand, ...	...	...	89	15	3						
						6,664	14	1			
Inefficient Balance,	...	...	...	...	470	0	3	7,134	14	4	
								21,456	4	9	

E. E.

W. S. ATKINSON,
Secretary.

STATEMENT

Abstract of the Oriental

				1855.	1856.
Balance of 1855 in the Bank of Bengal,	1,064	0	8		
Cash in hand,...	...	19	9	10	1,083 10 6
Inefficient Balance,	...	...	...	929	8 0
				<hr/>	2,013 2 6

SALE OF ORIENTAL PUBLICATIONS.

1,012 15 3

Received by Sale of Bib. Indica,	1,323 12 0
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GOVERNMENT ALLOWANCE.

6,000 0 0

Received from General Treasury, at 500 per month,...	...	6,000 0 0
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ASIATIC SOCIETY.

Received a Loan,...	0 0 0	2,500 0 0
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VESTED FUND.

361 1 0

Interest on Company's Paper from Government Agent,	...	209 7 6
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 Carried over, 12,046 6 0

No. 2.

Fund for the year 1856.

	1855.	1856.
SALE OF ORIENTAL PUBLICATIONS.	166 10 4	
Freight,	13 11 0
Commission,	66 0 9
		<hr/> 79 11 9
BIBLIOTHECA INDICA.	134 13 6	
Freight,	56 5 0
Printing Charges,	221 0 0
		<hr/> 280 5 0
CUSTODY OF ORIENTAL WORKS.	715 12 6	
Salary of Librarian, at 30 per month, 12mo.	...	360 0 0
Establishment, at 12 per month, do.	...	144 0 0
Petty Charges,	1 3 0
Stationery,	5 0 0
Book-binding,	150 4 0
Extra Duftty,	34 10 6
Postage,	10 0 0
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FOR FEBRUARY, 1857.

At a monthly general meeting of the Asiatic Society, held on the 4th instant.

The Venerable Archdeacon J. H. Pratt, Senior Member present, in the Chair.

The proceedings of the December meeting were read and confirmed. Presentations were received—

1. From the Government of Bombay, copies of "Selections from the Records of the Government."

The Secretary stated that these publications had been sent in compliance with a request made by the Council, who were glad to announce that the Government of Bombay had ordered that the Society should be supplied with all the Selections that may hereafter be published.

2. From the Imperial Academy of Sciences, Vienna, the latest publications of the Academy.

3. From the Government of the N. W. Provinces, through Captain MacLagan, Officiating Principal Thomason College of Civil Engineering, Roorkee, a copy of the Report on the Prisons of the N. W. Provinces, for the year 1855.

From Baron Von Hammer-Purgstall, a copy of his edition of Wasaf's celebrated history in Persian, with a German translation, vol. 1st.

Letters from Mr. Plowden, Lieut. Stewart, Dr. Martin, and Rev. K. M. Banerjee, announcing their wish to withdraw from the Society, were recorded.

The following gentlemen were named for ballot at the next meeting:—

Mr. H. F. Blanford, of the Geological Survey, proposed by Dr. Thomson, and seconded by Major Strachey, and

Mr. E. B. Cowell, Professor of History in the Presidency College, proposed by Mr. Atkinson, and seconded by A. Grote, Esq.

The Council submitted reports—

1. Recommending that Mr. John Nietner, of Ceylon, be elected a corresponding member of the Society.

2. Announcing that they have appointed the following Sub-Committees—

Finance.—C. Beadon, Esq. and Dr. T. Boycott.

Philology.—A. Grote, Esq., E. A. Samuells, Esq., Rev. J. Long, and F. E. Hall, Esq.

Library.—Dr. H. Walker, E. A. Samuells, Esq., W. Grapel, Esq., Bábu Ramápersád Roy, and Major Strachey.

Natural History.—Dr. G. G. Spilsbury, T. Oldham, Esq., Dr. H. Walker, Dr. T. Thomson, Dr. T. Boycott, Mr. E. A. Samuells, Captain C. B. Young, and Major Strachey.

Communications were received—

1. From Bábu Rádhánath Sikdár, forwarding abstracts of the Meteorological Register kept at the Office of the Surveyor-General, Calcutta, for the months of October and November last.

2. From Mr. Asst. Secy. Oldfield, enclosing copy of a Meteorological Register kept at the Office of the Secretary to the Government of the N. W. Provinces, Agra, for the month of November last.

3. From the Government of India, through Col. Birch, Secretary in the Military Department, forwarding a copy of the report by Mr. A. Schlagintweit on the proceedings of the Magnetic Survey in the Himalaya Mountain and in Western Thibet, from May to November, 1856, and that of Messrs. H. and R. Schlagintweit, on the same subject, from July to September, 1856.

4. From the Governor-General in Council, through Mr. Edmonstone, Secretary to the Government of India, a copy of an account of the mountain district forming the western boundary of the Lower Derajat, commonly called Roh, with notices of the tribes inhabiting it, by Lieut. H. G. Raverty, 3rd Regt. B. N. I.

5. From Capt. R. J. Leigh, Senior Assistant Commissioner to the Commander of Chota Nagpore, Notes on Jumeera Pat in Sirgooja, Chota Nagpore.

6. From Dr. Auderson, Oude Contingent, on the Indian species of the genus *Lycium*.

The Librarian submitted his usual monthly reports for December and January last.

Dr. Thomson read two reports from the Messrs. Schlagintweit of

their journey in Northern Thibet, and across the Koenlueu, with explanatory remarks.

On the motion of the Chairman, the thanks of the meeting were voted to Dr. Thomson for his remarks upon these interesting reports.

LIBRARY.

The library has received the following accessions during the months of December and January last.

Presentations.

Geschichte Wassaf's. Persisch Herausgegeben und deutsch übersetzt von Hammer-Purgstall, 1 Band, *Wien*, 1856, 4to.—BY THE BARON VON HAMMER-PURGSTALL.

Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Philos. Histor. Classe, Band, XVII. heft 3, Band XVIII. heft 1 and 2, Band XIX. heft 1 and 2 and Band XX. heft 1, 8vo.—BY THE ACADEMY.

————— Mathe. Natur. Hist. Classe, Band XVIII. heft 1 and 2, Band XIX. heft 1—2 and Band XX. heft 1, 8vo.—BY THE SAME.

Denkschriften der ditto ditto. mathematisch naturwissenschaftliche Classe, Band X. and XI.—BY THE SAME.

Archiv für Kunde österreichischer Geschichtsquellen. Band XV. heft 2 and Band XVI. heft 1, 8vo.—BY THE SAME.

Fontes Rerum Austriacarum ditto ditto. Band XII. abtheilung 2, 8vo.—BY THE SAME.

Jahrbücher der K. K. Central-Anstalt für Meteorologie und Erdmagnetismus von Karl Kriegl. Band IV.—BY THE SAME.

Almanach for 1856, 12mo.—BY THE SAME.

Notizenblatt, Nos. 1—14, 1856.—BY THE SAME.

Zeitschrift der Deutschen Morgenländischen Gesellschaft. Band X. heft 4, 8vo. *Liepzig*.—BY THE GERMAN ORIENTAL SOCIETY.

Die Lieder des Hafis. Persisch mit dem commentare des Sadi, herausgegeben von Hermann Brockhaus. Ersten Bandes, Drittes heft 4to. *Liepzig*, 1856.—BY THE EDITOR.

Memoirs of the Royal Astronomical Society, Vol. XXIV.—BY THE SOCIETY.

Notices of the Meetings of the Members of the Royal Institution of Great Britain, Part VI.—BY THE ROYAL INSTITUTION.

The Quarterly Journal of the Geological Society, Vol. XII. No. 47.—BY THE SOCIETY.

Monthly Notices of the Royal Astronomical Society from November, 1854 to June, 1855, Vol. XV.—BY THE SOCIETY.

Journal of the Proceedings of the Linnean Society, Vol. I. Nos. 1 and 2.—BY THE SOCIETY.

Address of T. Bell, Esq. President, read at the Anniversary of the above Society, May 24th, 1856.—BY THE SAME.

Natuurkundig Tijdschrift voor Nederlandsch Indië. Deel XII. Derde Serie, Deel II. afl. 1—3, 8vo.—BY THE NATURAL HISTORY SOCIETY OF NETHERLAND'S INDIA.

The Journal of the Indian Archipelago and Eastern Asia, Vol. IX. Nos. 10 to 12, new series, Vol. I. No. 1, 2 copies.—BY THE EDITOR.

Ethnology of the Indo-Pacific Islands, by J. R. Logan, Esq. 2 copies.—BY THE AUTHOR.

Selections from the Records of the Bombay Government in the Police Branch of the Judicial Department, Nos. 1 and 2, (the last is an incomplete copy).—BY THE BOMBAY GOVERNMENT.

————— No. XXXV. new series, being a report on the Hilly region forming the Western part of the Collectorate of Kurrachee.—BY THE SAME.

————— from the Records of the Government of the N. W. Provinces, Parts XXVII. and XXVIII. the 1st chiefly on Public Works and the 2nd connected with the Revenue.—BY THE GOVERNMENT OF THE N. W. P.

————— from the ditto of the Government of India, (Home Department,) No. XVII. Report on the Survey of the Mineral Deposits in Kumaon and on the Iron Smelting Operations experimentally conducted at Dechouree.—BY THE GOVERNMENT OF INDIA.

————— (Foreign Department) No. XVIII.—General Report on the Administration of the Punjab Territories from 1854-55 to 1855-56 inclusive.—BY THE SAME.

————— (Public Works Department) No. XIX.—Reports on the Communication between Calcutta and Dacca. 2nd. On the Progress of the Dacca and Arracan Road. 3rd. On the Creek Navigation from Akyab to Toungoop. 4th. On the Toungoop Mountain Road.—BY THE SAME.

Report of the Inspector General of Prisons, North Western Provinces for 1855.—BY CAPTAIN MACLAGAN, OFFG. PRINCIPAL OF THE THOMAS ENGINEERING COLLEGE AT ROORKEE.

Half-yearly Report of the Committee of the Bengal Chamber of Commerce.—BY THE CHAMBER OF COMMERCE.

Journal Asiatique for July and August, 1856, Nos. 28, 29 and 30.—BY THE SOCIÉTÉ ASIATIQUE.

Report of Dispensary Cases of the Medical College Hospital.—BY DR. CHUCKERBUTTY.

Essai sur la Littérature Indienne et études Sanscrites par P. Soupé, 12mo. *Paris*.—BY THE AUTHOR.

Catalogo dei Coleopteri della Lombardia compilat dai Antonio. E. G. B. Villa. *Paris*.—BY THE AUTHOR THROUGH MR. PIDDINGTON.

Catalogo dei Molluschi della Lombardia ditto, ditto. *Paris*.—BY THE SAME THROUGH DITTO.

Dispositio Systematica Conchyliarum Terrestrium et Fluvialium quæ adservantur in collectione fratrum, ditto.—BY THE SAME THROUGH DITTO.

Intorno alla Malattia delle viti relazione di Antonio Villa. *Paris*.—BY THE SAME THROUGH DITTO.

Notizie intorno al genere melania memoria Malacologica dei ditto. *Paris*.—BY THE SAME THROUGH DITTO.

Osservazioni Entomologiche durante l' eclisse del 9 Ottobre, 1847. *Paris*.—BY THE SAME THROUGH DITTO.

Intorno All' *Helix frigida* (2 leaves).—BY THE SAME THROUGH DITTO.

The Oriental Christian Spectator, for November and December, 1856.—BY THE EDITOR.

The Oriental Baptist, for December, 1856 and January, 1857.—BY THE EDITOR.

The Calcutta Christian Observer, for ditto ditto.—BY THE EDITORS.

Upadeshak, for ditto ditto.—BY THE EDITOR.

The Durbin Newspaper, for ditto ditto.—BY THE EDITOR.

The Phoenix ditto, ditto ditto.—BY THE EDITOR.

The Morning Chronicle ditto, ditto ditto.—BY THE EDITOR.

The Tattwabodhiní Patriká, for December, 1856,—BY THE TATTWABODHINI' SABHA'.

The Indian Annals of Medical Science, No. VII. October, 1856.—BY THE EDITOR.

Exchanged.

The Athenæum, for October, 1856.

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, No. 80.

The Calcutta Review, No. 54, for December, 1856.

Purchased.

Comptes Rendus, Nos. 12 to 15.

The Literary Gazette, Nos. 34 to 38.

The Annals and Magazine of Natural History, for November, 1856.

Revue des Deux Mondes, for October and November, 1856.

Revue et Magasin de Zoologie, No. 9.

A complete Grammar of the Dravidian or South-Indian family of Languages, by the Rev. R. Caldwell, *London*, 1856, 8vo.

Revue Contemporaine et Athenæum Français, Nos. 109 and 110, 15th and 31st October.

Journal des Savants, for September, 1856.

Matlai ul Saadeyn, or a History of Iran and Turan, MS.

Hajjat ul Mahafel Tajkireh Dad Intâki.

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Kitáb ul Safá batáaríf ul Haqúq ul Mustafí. MS.

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Yusuf Zulekhá. MS.

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Hadikat ul Sahádayn, History of Martyrs ; Turkish.



Meteorological Observations.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1857.

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Fet.

Height of the Cistern of the Standard Barometer above the Sea level, 18.11.

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahit.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	30.031	30.118	29.970	0.148	66.8	76.6	60.9	16.6
2	.099	.169	30.042	.127	66.7	76.0	59.4	16.6
3	.106	.204	.050	.154	67.5	77.1	60.0	17.1
4	<i>Sunday.</i>							
5	.097	.150	.050	.100	70.8	80.0	63.5	16.5
6	.144	.214	.099	.115	71.1	80.2	63.5	16.7
7	.094	.171	.021	.150	71.9	81.0	63.8	17.2
8	.080	.156	.029	.127	72.1	80.3	66.0	14.3
9	.095	.191	.053	.138	69.1	77.4	62.8	14.6
10	.089	.160	.041	.119	67.9	76.5	60.7	15.8
11	<i>Sunday.</i>							
12	.099	.187	.040	.147	67.2	77.4	59.7	17.7
13	.113	.190	.055	.135	65.6	76.0	56.7	19.3
14	.092	.167	.045	.122	66.3	76.6	57.4	19.2
15	.055	.140	29.990	.150	66.7	74.9	60.6	14.3
16	.060	.130	30.018	.112	66.6	74.3	61.0	13.3
17	.037	.114	29.975	.139	64.6	73.9	57.6	16.3
18	<i>Sunday.</i>							
19	29.999	.089	.938	.151	65.1	75.3	58.0	17.3
20	30.004	.090	.944	.146	62.9	73.1	54.6	18.5
21	.009	.108	.954	.154	61.8	73.3	52.8	20.5
22	29.986	.076	.918	.158	62.1	72.2	53.6	18.6
23	.979	.067	.920	.147	62.8	75.0	53.9	21.1
24	.968	.059	.913	.146	63.9	76.3	54.4	21.9
25	<i>Sunday.</i>							
26	.938	.015	.887	.128	69.3	81.6	59.4	22.2
27	.902	29.979	.842	.137	71.4	82.2	63.6	18.6
28	.881	.956	.833	.123	73.7	84.1	65.4	18.7
29	.882	.955	.830	.125	73.3	84.5	64.4	20.1
30	.873	.951	.818	.133	73.7	84.9	63.8	21.1
31	.887	.965	.841	.124	74.4	84.3	66.4	17.9

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived, from the twenty-four hourly observations made, during the day.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January, 1857.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon. (Continued.)

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Va- pour required for com- plete saturation.	Mean degree of Humi- dity, complete satura- tion being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
1	61.6	5.2	58.5	8.3	.0498	5.51	1.75	.076
2	62.0	4.7	59.2	7.5	.509	.64	.59	.78
3	63.3	4.2	60.8	6.7	.537	.94	.48	.80
4	<i>Sunday.</i>							
5	65.4	5.4	62.7	8.1	.572	6.29	.91	.77
6	66.2	4.9	63.7	7.4	.591	.50	.78	.79
7	66.9	5.0	64.4	7.5	.605	.63	.85	.78
8	67.7	4.4	65.5	6.6	.628	.88	.65	.81
9	62.9	6.2	59.8	9.3	.520	5.73	2.05	.74
10	60.9	7.0	56.7	11.2	.469	.17	.34	.69
11	<i>Sunday.</i>							
12	60.2	7.0	56.0	11.2	.458	.07	.28	.69
13	59.4	6.2	55.7	9.9	.453	.03	1.97	.72
14	61.3	5.0	58.3	8.0	.494	.47	.68	.77
15	62.3	4.4	59.7	7.0	.518	.74	.49	.79
16	61.3	5.3	58.1	8.5	.491	.43	.78	.75
17	58.9	5.7	55.5	9.1	.450	.01	.77	.74
18	<i>Sunday.</i>							
19	58.6	6.5	54.7	10.4	.438	4.87	2.02	.71
20	55.2	7.7	49.8	13.1	.371	.14	.29	.64
21	55.2	6.6	50.6	11.2	.381	.26	1.95	.69
22	54.6	7.5	49.3	12.8	.365	.07	2.20	.65
23	56.1	6.7	51.4	11.4	.392	.38	.03	.68
24	57.0	6.9	52.2	11.7	.402	.48	.15	.68
25	<i>Sunday.</i>							
26	62.6	6.7	59.2	10.1	.509	5.62	.21	.72
27	66.6	4.8	64.2	7.2	.601	6.60	1.75	.79
28	67.8	5.9	64.8	8.9	.613	.71	2.25	.75
29	65.9	7.4	62.2	11.1	.563	.15	.69	.70
30	65.9	7.8	62.0	11.7	.559	.10	.86	.68
31	67.2	7.2	63.6	10.8	.590	.43	.72	.70

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January, 1857.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid- night.	30.022	30.148	29.874	0.274	64.2	70.5	56.7	13.8
1	.014	.110	.870	.270	63.4	69.8	56.0	13.8
2	.010	.118	.853	.265	62.5	69.0	55.0	14.0
3	29.998	.106	.841	.265	62.2	68.6	54.8	13.8
4	.995	.102	.841	.261	61.5	68.2	54.2	14.0
5	.998	.114	.817	.267	60.9	67.8	53.5	14.3
6	30.020	.133	.856	.277	60.5	67.1	53.0	14.1
7	.043	.155	.883	.272	60.2	66.4	52.8	13.6
8	.072	.191	.917	.274	62.0	68.6	54.6	14.0
9	.096	.207	.936	.271	65.9	72.3	59.0	13.3
10	.102	.214	.949	.265	69.1	75.4	62.0	13.4
11	.086	.201	.930	.271	71.9	79.2	65.3	13.9
Noon.	.055	.172	.909	.263	74.6	81.4	67.8	13.6
1	.018	.143	.876	.267	76.5	83.4	70.3	13.1
2	29.993	.123	.853	.270	77.5	84.4	71.8	12.6
3	.977	.104	.834	.270	77.9	84.9	72.2	12.7
4	.971	.108	.830	.278	76.1	83.4	70.9	12.5
5	.973	.113	.820	.293	74.7	81.6	69.0	12.6
6	.980	.121	.818	.303	72.0	78.8	66.2	12.6
7	.997	.126	.838	.288	70.0	76.0	64.3	11.7
8	30.017	.152	.856	.296	68.4	74.8	61.6	13.2
9	.030	.163	.873	.290	67.2	73.6	60.6	13.0
10	.035	.177	.879	.298	66.1	72.6	59.4	13.2
11	.032	.162	.875	.287	65.5	71.6	58.5	13.1

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January, 1857.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued.)

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew point.	Dry Bulb above Dew point.	Mean elastic force of Vapour.	Mean Weight of Va- pour in a Cubic foot of Air.	Additional weight of vapour required for complete saturation.	Mean degree of hu- midity, complete satu- ration being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid- night.	60.8	3.4	58.4	5.8	0.496	5.51	1.18	0.82
1	60.3	3.1	58.1	5.3	.491	.47	.06	.84
2	59.5	3.0	57.4	5.1	.480	.36	0.99	.84
3	59.1	3.1	56.9	5.3	.472	.27	1.02	.84
4	58.7	2.8	56.7	4.8	.469	.24	0.92	.85
5	58.0	2.9	55.7	5.2	.453	.08	.96	.84
6	57.7	2.8	55.5	5.0	.450	.05	.92	.85
7	57.5	2.7	55.3	4.9	.447	.02	.89	.85
8	58.7	3.3	56.4	5.6	.464	.18	1.07	.83
9	60.8	5.1	57.7	8.2	.485	.37	.69	.76
10	62.3	6.8	58.9	10.2	.504	.56	2.22	.72
11	63.6	8.3	59.4	12.5	.513	.61	.87	.66
Noon.	64.7	9.9	59.7	14.9	.518	.65	3.55	.61
1	65.5	11.0	60.0	16.5	.523	.67	4.08	.58
2	65.5	12.0	59.5	18.0	.515	.57	.47	.56
3	65.7	12.2	59.6	18.3	.516	.59	.57	.55
4	64.6	11.5	58.8	17.3	.503	.46	.17	.57
5	64.8	9.9	59.8	14.9	.520	.66	3.57	.61
6	64.9	7.1	61.3	10.7	.546	.99	2.51	.71
7	64.2	5.8	61.3	8.7	.546	6.01	1.99	.75
8	63.3	5.1	60.2	8.2	.527	5.82	.80	.76
9	62.6	4.6	59.8	7.4	.520	.75	.60	.78
10	62.0	4.1	59.5	6.6	.515	.70	.40	.80
11	61.8	3.7	59.6	5.9	.516	.73	.25	.82

All the Hygrometrical elements are computed by the Greenwich constants.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January, 1857.*

Solar radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	130.0	..	N. W.	Cloudless till 6 A. M. scattered \searrow i till 8 P. M. cloudless afterwards.
2	126.0	..	N. W.	Cloudless.
3	130.9	..	N. W. & W.	Cloudless.
4	<i>Sunday.</i>			
5	135.5	..	N. W. & S. W.	Cloudless till 10 A. M. scatd. \searrow i & \searrow i till 5 P. M. cloudless & foggy afterwards.
6	136.0	..	Variable.	Cloudless till 4 P. M. scatd. \searrow i afterwards, also foggy after sunset.
7	132.5	..	N. & N. W.	Cloudless till 1 P. M. scatd. \searrow i till 6 P. M. cloudless afterwards. Also foggy in the morning and evening.
8	131.0	..	Variable.	Scatd. \searrow i & \searrow i till 9 A. M. cloudless till 11 A. M. scatd. \searrow i till 4 P. M. cloudless afterwards.
9	129.2	..	N. W.	Cloudless till 7 A. M. scatd. \searrow i till Noon, cloudless afterwards.
10	127.0	..	N. & N. W.	Cloudless.
11	<i>Sunday.</i>			
12	133.5	..	N. & N. W.	Cloudless.
13	131.0	..	N.	Cloudless till 7 A. M. scatd. \searrow i & \searrow i till 6 P. M. cloudless afterwards.
14	129.0	..	W. & Calm.	Cloudless till 6 A. M. scatd. \searrow i till 6 P. M. cloudless afterwards.
15	115.0	..	W.	Scatd. \searrow i till Noon, scatd. \searrow i till 6 P. M. cloudless afterwards.
16	111.5	..	N.	Cloudless till 2 A. M., cloudy till 6 P. M. cloudless afterwards.
17	131.0	..	N. W.	Cloudless till 6 A. M. scatd. \searrow i & \searrow i till 6 P. M. cloudless afterwards.
18	<i>Sunday.</i>			
19	133.0	..	N. W.	Cloudless.
20	129.0	..	N. W.	Cloudless.
21	133.0	..	N. W.	Cloudless.
22	132.0	..	N. W.	Cloudless.
23	130.4	..	N. & N. W.	Cloudless.
24	133.2	..	N. W. & N.	Cloudless.
25	<i>Sunday.</i>			
26	138.2	..	Calm & S.	Cloudless. [ing.
27	141.0	..	Variable.	Cloudless and heavy fogs in the morn-
28	141.0	..	S. & W.	Cloudless and foggy in the morning.
29	140.0	..	S. W.	Cloudless.
30	143.0	..	N. W. & S. W.	Cloudless.
31	134.0	..	S. & W.	Cloudless.

\searrow i Cirri, \searrow i cirro strati, \searrow i cumuli, \searrow i cumulo strati, \searrow i nimbi, — i strati, \searrow i cirro cumuli.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January, 1857.*

MONTHLY RESULTS.

			Inches.
Mean height of the Barometer for the month,	...	...	30.022
Max. height of the Barometer, occurred at 10 A. M. on the 6th,	...	...	30.214
Min. height of the Barometer, occurred at 6 P. M. on the 30th,	...	...	29.818
Extreme Range of the Barometer during the month,	...	...	0.396

			°
Mean Dry Bulb Thermometer for the month,	...	...	68.0
Max. Temperature, occurred at 3 P. M. on the 30th,	...	...	84.9
Min. Temperature, occurred at 7 A. M. on the 21st,	...	...	52.8
Extreme Range of the Temperature during the month,	...	...	32.1

			°
Mean Wet Bulb Thermometer for the month,	...	...	61.9
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,	...	...	6.1
Computed Mean Dew Point for the month,	...	...	58.2
Mean Dry Bulb Thermometer above computed Mean Dew Point,	...	...	9.8
Mean Elastic force of vapour for the month,	...	...	Inches. 0.493

			Troy grains.
Mean weight of vapour for the month,	...	...	5.44
Additional weight of vapour required for complete saturation,	...	...	2.09
Mean degree of Humidity for the month, complete saturation being unity,	...	...	0.72

			Inches.
Rained No. days. Max. fall of rain during 24 hours,	...	...	Nil.
Total amount of rain during the month,	...	...	Nil.
Prevailing direction of the Wind,	...	...	N. W. & N.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January, 1857.*

MONTHLY RESULTS.

Table showing the number of days on which at a given hour any particular wind
blew, together with the number of days on which at the same hour,
when any particular wind was blowing it rained.

Hour.	N. Rain on.	N. E. Rain on.	E. Rain on.	S. E. Rain on.	S. Rain on.	S. W. Rain on.	W. Rain on.	N. W. Rain on.	Calm. Rain on.
	No. of days.								
Midnight.	4		1		5	1	2	9	5
1	5		1		5	1	2	9	4
2	4		1		4	1	1	10	5
3	4				4	2	1	12	4
4	4				3	3	1	13	3
5	4				2	3	3	11	3
6	6			1	2	2	3	11	2
7	5	4		1	2	2	3	9	1
8	7	5	1		2	1	3	7	1
9	7	7		1	2	1	3	6	
10	10	5			2	2	3	5	
11	11	4	1		2	1	2	6	
Noon.	5	5		1	1	2	1	12	
1	5	1				4	4	13	
2	4					6	6	11	
3	2	1				2	11	11	
4	3					3	8	13	
5	2					2	8	15	
6	7				2	1	6	11	
7	6				2	2	5	11	1
8	7				2	3	3	11	1
9	9				3	2	3	8	2
10	8				3	2	4	8	2
11	7				3	3	3	8	2

